THE ERA OF LIVING SERVICES
LIVING SERVICES ARE THE RESULT OF TWO FORCES

DIGITIZATION OF EVERYTHING AND LIQUID EXPECTATIONS
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 LIVING SERVICES: DESIGNED FOR LIFE</td>
<td>04</td>
</tr>
<tr>
<td>02 CREATIVE DESTRUCTION: HOW LIVING SERVICES WILL CHALLENGE BUSINESSES</td>
<td>18</td>
</tr>
<tr>
<td>03 A BRAVE NEW WORLD FOR BRANDS</td>
<td>26</td>
</tr>
<tr>
<td>04 WHERE WILL LIVING SERVICES EMERGE?</td>
<td>32</td>
</tr>
<tr>
<td>05 PREPARE TO ATOMIZE</td>
<td>66</td>
</tr>
<tr>
<td>06 DESIGNING FOR ONE: SERVICES MADE TO MEASURE</td>
<td>74</td>
</tr>
<tr>
<td>07 PRIVACY AND ETHICS: NAVIGATING OUR CHANGING VALUES</td>
<td>86</td>
</tr>
</tbody>
</table>
01
LIVING SERVICES: DESIGNED FOR LIFE
What are Living Services?

Living Services are the result of two powerful forces: the digitization of everything and ‘liquid’ consumer expectations.

Living Services respond by wrapping around us, constantly learning more about our needs, intents and preferences, so that they can flex and adapt to make themselves more relevant, engaging and useful. Consumers demand this now as the standards are being set by the best of breed across the entirety of their experiences, not restricted by sector—hence liquid expectations.

This is an incredibly exciting time, as we are on the cusp of the next major wave of transformative digital services. We are already seeing the integration of smart digital technology into many inanimate objects, devices and machines. Just like the previous two waves—the desktop Web in the 1990s and mobile in the 2000s—this will be truly transformative for business and society alike. Some call it the 'Internet of Things,' but in our view this does not accurately describe the inherent benefits this age will bring and its key characteristics. We think this is the era of Living Services.

Over the next five years, sensors, the cloud, connected smart devices and realtime analytics will combine to deliver a new layer of connected intelligence that will revolutionize the ability of brands and organizations to offer interesting and increasingly indispensable digital services to consumers.

Living Services are highly sophisticated and able to constantly learn and evolve, almost as if they are alive. They will transform and improve the way we live, both by removing mundane tasks and offering services that surprise and delight us. By being physically close to us and wrapping themselves around the everyday things we do, Living Services will intuitively learn our habits, likes and dislikes and become tailored to our individual and changing needs. The result is digital services that are contextually aware and able to react in real time to changes in the environment or our patterns of behavior—creating once unimaginable engaging experiences.
A defining characteristic of Living Services is that they will be designed around the needs of individuals, as opposed to generic services defined by an organization for mass consumption.

Living Services will profoundly affect brands (see Chapter 3) and design (we consider how in Chapter 6). The challenge will be that design must become tailored, responsive and able to adapt quickly to changing circumstances. Visual, screen-based design will retain a central role, but designers will have to engage more with human senses including voice, gesture and sensors on the body, and recognize ambient circumstances such as temperature and location inputs. The role of design will become more important than ever.

Designers will need to focus not only on ergonomic and operational concerns (what is the user’s physical context/what do we need to deliver to him now?), but also on emotional and physiological concerns (how is this person feeling physically/what is her state of mind?). This will be increasingly possible as technology delivers the data required to understand these factors. With so many considerations to take into account when designing Living Services, it’s important that designers exploit the full capabilities of the technology at their disposal to incorporate elements in their services that amaze and excite consumers, and help build a lasting relationship with the brand in question.

LIVING SERVICES: THE THIRD WAVE OF DIGITAL
It’s tempting to simplify the arrival of Living Services as a single shift in technology (by reference to smart devices, for example). In fact, Living Services are the next wave of digital transformation that has been challenging businesses for the past 20 years.

Each digital wave has added to and built on the previous one. The first wave was the desktop Web. It started in the early 1990s and hit the commercial mainstream in the second half of the decade, triggering the dot-com boom and bust. Its impact has been powerful. The desktop Web revolution ushered in Internet services such as eBay and Amazon, which disrupted the way in which consumers buy and sell products. These businesses are still powering the digital economy. Similarly, Google revolutionized how people searched for information, while early social media channels such as Friendster began to change the way in which we connect and interact with friends and family.

THE MOBILIZATION OF DIGITAL SERVICES
The second wave has been happening over the past 10 years and is all about the relentless rise of mobile. The first decade of the 21st century has seen the inexorable spread of mobile phones across the world and the acceptance of some mobility fundamentals, such as texting, payments and the mobile Internet.

From 2007, the launch of the iconic iPhone accelerated both consumer take-up of smart mobile devices and sparked an intense period of innovation. Established handset technology and computer brands began competing with new entrants such as Google and Microsoft, offering alternative operating systems.

Smart mobile computing is approaching ubiquity in developed markets. As of press time, the Pew Research Internet project reports that 64% of U.S. adults own a smartphone.
In 2014, mobile firmly replaced desktop as the primary means of accessing digital services. A U.S. study by ComScore found that smartphones and tablets accounted for 60% of total digital media time spent, up from 50% the previous year.

Smartphones also spawned a whole new mobile software ecosystem in the form of apps, which introduced new mass-market brands such as Minecraft and Angry Birds, and a new tech lexicon.

The consumer’s love affair with smartphone technology means that social media such as Facebook and Twitter have become multi-channel services, and mobile has prompted the creation of social channels such as WhatsApp, Tinder, Instagram and Snapchat.

This wave has also been transformative through smartphone geolocation capabilities and technologies that can contextualize information in real time. Most consumer service sectors have been influenced by, or evolved in, what they offer as a result of the mobile app revolution.

In mobile banking and payments, innovative services such as Venmo and Square are emerging forces. For navigation, Google Maps has become indispensable, while research platforms Yelp and AroundMe are becoming common location-based reference points; Dropbox is a favorite for data storage and sharing; Skype for low-cost calls; Evernote for personal information—the list is endless.

**WAVE THREE: BEYOND THE INTERNET OF THINGS**

The third wave of digital innovation has naturally progressed to the point where businesses are actively integrating connected technology into other objects.

The ‘Internet of Things’ is the term now commonly used to describe a future where everything—from fridges to milk cartons, medicine dispensers, wearable technology and cars—will talk to us, our smart devices and each other. Some of the projections feel pointless (egg cartons? Really?) others, highly disruptive.

Living Services are a step beyond the limited descriptor ‘Internet of Things.’ In effect, they breathe life into what will become a vast network of connected machines and objects, enabling branded services to flow through and utilize this connected environment. This will also accelerate the “atomization” of services, something we explore in Chapter 5.

AroundMe is one of the common location-based reference points.
Living Services are a natural evolution from desktop and mobile. It is the growing infusion of digital technology into the hardware and built environments that surround us in the modern world.

WHY NOW?

THE BREAKING WAVE

It is true that many of the conceptual ideas—from challenging to pointless—behind Living Services have been with us for a decade or even longer. ‘Smart’ objects that are able to help us by understanding what we need and when, the arrival of artificial intelligence, ubiquitous access to computing, the fusion of physical and virtual reality, and seamless supply of information are all ideas that were being actively discussed in the late 1990s. So what is new? The answer is that all of the concepts above are now deliverable at scale. It is not only possible to create true Living Services, but it is becoming a business imperative that is driven by consumer expectations.

We are very close to Living Services becoming mass-market phenomena. In the next two years we will see Living Services start to transform a wide range of industries and markets in different ways. Current investor interest in sectors like ‘wearables’ will shortly broaden into sustained widespread investment in the services that flow through new devices and a diverse mix of companies becoming involved in their development, rather than individual companies carrying out isolated experimentation.

But the key driving force behind Living Services is changing consumer expectations across two areas: cultural and commercial. Culturally, consumers, particularly in the younger age groups, are placing greater emphasis on the importance of life outside work, than older generations. A report by the White House on the millennial generation (those born between 1980 and the mid-2000s), found that a greater number of this group valued life goals such as having time for recreation and finding new ways to experience things than those from ‘Generation X’ or the ‘baby boomer’ generation. This cultural shift is driving the development of Living Services, which not only simplify and improve our lives but also provide the tools to help us enjoy our leisure time more fully, by offering innovative

‘Smart’ objects that are able to help us by understanding what we need and when.
and delightful ways for us to discover new music, friends, fashion and hobbies.

When it comes to consumers’ commercial expectations, these have become truly liquid across different product and service categories. In the past, banks competed with banks for excellence in experience (if, indeed, they paid attention to it). But now if an organization’s experience fails to meet standards set by companies that do not directly compete with it, then it will be seen to fail. Consumers no longer compare their brand experiences of two different banks; rather they make comparisons between their brand experience of their bank with a best-in-class airline, or worse, a design-driven startup such as Uber. What’s more, as their experience of connected digital services grows, consumers can see for themselves how technology and digital services could be improved across a wide variety of sectors. They can imagine how services could evolve to make their lives easier and better. They will be attracted to the services that leap forward and transform markets, reshaping their expectations in the process. Once a new way of doing things takes root, consumers’ interest and usage will coalesce around the services capable of delivering it. In some ways, we are all designers now!

In this age of liquid consumer expectations, businesses have a choice: either reshape the way they deliver their services or products, or continue to see the control of every aspect of the customer experience slip from their grasp. We give our thoughts on how to do this in Chapter 2.

To avoid the erosion of customer relationships, businesses will need to know their customers as individuals and then flex their services over multiple delivery touch points to meet those individuals’ needs according to the ever-changing context they find themselves in. As we have seen in previous waves, some sectors will be affected by Living Services more quickly than others. Healthcare is one area where we will see Living Services emerge first, led by quantified self-health tracking devices. Similarly, the connected car is fast becoming a reality, while in the home, we can expect to see people start to manage more and more aspects of their lives remotely from their devices. We will begin to see Living Services on a city scale emerge by 2020; however, because of the complexities involved, this is likely to be limited to a handful of leading ‘landmark’ connected cities emerging in regions such as the Middle East and Asia.

It is not only possible to create true Living Services, but it is becoming a business imperative that is driven by consumer expectations.

By 2020, we can expect Living Services to have a significant impact on the services and maintenance of buildings, equipment, factories and machines, which will result in a move away from a maintenance schedule based on averages to individually tailored schedules. This will have a profound impact on the economics of running a wide variety of businesses and industries. Economics will be a key catalyst: businesses that don’t invest in Living Services to help them become more efficient and cost-effective will find themselves at a competitive and commercial disadvantage.

Another important spur for the mass adoption of Living Services will be growing consumer demand for tailored services that combine into new benefits, in terms of saving time and money or improving...
quality of life. For example, consumers will opt into a service that connects sensors on their car to discounts on their car insurance for safe driving (as proved by the sensors). Consumers are likely to choose a utility provider that offers not just advice on energy efficiency but the ability to optimize it, allowing them to save money and reduce their energy consumption and carbon footprint at the same time.

**HOW WILL LIVING SERVICES CHANGE OUR LIVES?**

Living Services will initially automate many of the small, low-maintenance decisions we consciously make in our everyday lives. At home, personalized Living Services could adjust the heating, lighting or music volume to fit with the preferences of the person walking into the room, and take into consideration the time, temperature and daily behavioral pattern of that individual or family group. As well as taking over boring and everyday tasks, Living Services have the capability to help us get the most out of our leisure and downtime. By continually learning and forging long-term, (and if they are to be successful) meaningful relationships with us, Living Services will come to know what we enjoy doing, and will understand the context of our lives including our time and financial restrictions, how happy, healthy and fit we are, and with whom we are spending our leisure time.

Designed to learn through realtime analytics, they will be able to curate choices and deliver personalized recommendations tailored to the weather, our location, mood, health and even our bank balance. The best designed of these will have the potential to enhance our lives by injecting elements of surprise, delight and wonder into our daily routines. These could range from automatically downloading a playlist of our favorite boyband’s hits to our smartphone as we travel to their concert, or spontaneous recommendations for accessible, nearby tearooms suitable for the elderly relative who is visiting.

Living Services will be powered by our data, collected from sensor-rich objects and devices we interact with, apps and everyday services we use, such as banking, as well as historical, behavioral (if we permit this) and third-party contextual data, including weather or travel information. It will be the responsibility of organizations from business to government to non-governmental organizations (NGOs) to create Living Services that are suitable and helpful to their customers, citizens and users.

Much of this will happen in the background so consumers won’t necessarily consciously engage, even as they reap the benefits Living Services bring.

So Living Services have the potential to touch most aspects of our home and work lives—we cover this more in depth in Chapter 4. Automated learning services that streamline decision-making have the potential to impact leisure, business and industrial operations. In each scenario it is the shift from a one-size-fits-all solution to customized services to fit the individual, delivered with a level of automation and contextual integrity that enables them to act and feel intuitive.

As Living Services become more mainstream, they will unleash new competitive forces in business and the public sector, which will require companies and organizations to rethink their business structures and practices in the same way as we have seen with the desktop Web and now mobile. From manufacturing and service delivery to sales, customer relationship management, marketing and branding, the opportunity to create and enhance interactions with customers and suppliers will fundamentally transform the way we do business and organize public sector bodies.
WHERE WILL WE EXPERIENCE LIVING SERVICES?

OUR HOMES:
Managing energy, shopping, security, environment, entertainment, our diaries and budgeting.

OUR BODIES:
Fitness and dietary advice, training, illness diagnostics and personal health diary planning.

OUR FAMILIES:
Everyday schedule management, diary coordination, location and status updates and cultural and social event recommendations.

OUR JOBS:
Coordinating travel arrangements, diary workload management, learning and reading recommendations, resource management and decision-making advice.

OUR CARS/TRANSPORT:
Driving management and support, maintenance management, route planning, traffic information, insurance assessments, roadside attractions and services, media and work communications, fuel and energy management, social media and entertainment.

OUR MONEY:
Balance management, moving money, shopping decision-making, investment advice, mortgage advice and borrowing.

OUR SHOPPING:
Automated ordering, price comparisons, discount or promotion research, budget advice, automated search and offer comparisons and social sharing.

OUR LEARNING:
Learning and career plans tailored to the individual child's specific developmental needs, right down to realtime monitoring of her mood and alertness; automatic recording of students' presence or absence from a class; realtime parental involvement in classrooms.

OUR LEISURE TIME:
Realtime, contextually appropriate recommendations, content curation, bespoke offers, information on travel/parking options, decision-making tools.

OUR CITIES:
Managing congestion, combatting crime, street lighting, infrastructure, the environment, building repairs, waste collection and planning.
In theory at least, by cumulatively removing many mundane aspects from our lives and making other tasks we perform/daily challenges we face much easier and more enjoyable, we will have far more freedom to enjoy creative, social or educational aspects of our lives. There is a clear risk here of techno-utopianism, and we should emphasize that Living Services bring ethical challenges to society that will need resolution by all stakeholders —you can read more about this in Chapter 7.

Which technologies are enabling the rise of Living Services?

THE GROWTH OF CONNECTED DEVICES
There are six main technological innovations that are paving the way for Living Services. The first is the predicted future growth of connected devices. Latest estimates from Gartner suggest that there will be 30 billion connected devices by 2020 (up from 2.5 billion in 2009).

Mobile technology will be a critical element powering the evolution of Living Services. Between 2013 and 2017, mobile phone penetration will rise from 61.1% to 69.4% of the global population according to an eMarketer report: “Worldwide Mobile Phone Users: H1 2014 Forecast and Comparative Estimates.” Mobiles will often play the role of a remote control that makes other connected devices meaningful, responsive or even visible at all.

These devices will not only be connected to each other and the Internet, but will feature a huge array of sensors with the ability to capture and analyze vast amounts of data, often in realtime.

CONNECTED SENSORS
So the second enabler is the widespread availability of sensors—increasingly cheap, durable, small and connected. The ‘Internet of Things’ has already moved beyond speculation.

Cisco IBSG estimates the ‘Internet of Things’ was ‘born’ sometime between 2008 and 2009. It predicts that by 2020 there will be 50 billion connected devices: an average of almost 6.6 per person worldwide.

However, according to Acquity Group’s Internet of Things Report 2014, although mass adaption of connected technology is likely in the long term, the majority of consumers (87%) hadn’t heard of the term the ‘Internet of Things’ prior to the study. In fact, the top barrier to mass adaption of this technology is a lack of both awareness and value perception among consumers.

A report by Markets and Markets states that the market value for sensors that translate physical information into data, for example flow sensors, dissolved oxygen, temperature, pressure and touch, is expected to generate revenue of $10.46 billions by 2020, growing at an estimated Compound Annual Growth Rate (CAGR) of 36% from 2012 to 2020.

We are already used to sensors in smart mobile devices and increasingly wearables on our wrists, such as Pebble, Jawbone, Fitbug Orb and the Apple Watch. We will soon become used to these sensors woven into more and more everyday scenarios.

These small sensors can detect a wide range of different variables from “is the light on?” and “is there movement here?” to “what is the location?” and “what is the speed of movement?”
We are already used to sensors in smart mobile devices and increasingly wearables on our wrists, such as Pebble, Jawbone, Fitbug Orb and the Apple Watch.

Sensors will also travel with us. An early indication of the kind of uses they may be put to was evident with the Copenhagen Institute of Interaction Design's smart umbrella, which measures air pollution levels including nitrogen dioxide, carbon monoxide as well as temperature and humidity.

The ‘sensing umbrella’ prototype can share the information it collects via Wi-Fi networks, allowing pollutant levels—together with time and location data—to be uploaded to the cloud and used for analysis.

A report by Strategy Analytics, titled Broadband and Wi-Fi Households Global Forecast 2012 predicted that worldwide household Wi-Fi connectivity would grow from 439 million households worldwide, equivalent to 25% of all households, to 800 million by 2016, 42% of households.

Continued investment in the rollout of hyper-fast data delivery infrastructure is critical to the creation of Living Services that blend seamlessly into our lives.

**NETWORK CONNECTIVITY**
The third core enabler is low-cost, ubiquitous, fast network connectivity. Sensors on their own are not transformative: Fast networks and increasing bandwidth enable smart devices to transmit data collected and receive large volumes when required.

**THE CLOUD**
From a business and marketing point of view, the number of digital touch points generating data from consumers and employees is increasing exponentially. And as the number of digital applications used by stakeholders’ increases, storing the vast amount of data generated by them is becoming a significant challenge for enterprises.
Cloud Computing is the fourth key enabler of Living Services.

Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014-2019 predicts cloud applications will account for 90% of total mobile data traffic by 2019, compared with 81% at the end of 2014.

Storing data is just part of the problem. Enterprises and public sector organizations require data to be consistent in form and also easily accessible. Using cloud computing creates a centralized and secure place from which organizations can draw, cross-reference and analyze information. Data in a consistent standard form can be integrated into business operations in a transformative way.

A centralized, standard data facility that can be plugged seamlessly into every aspect of a corporation’s operations is a critical step towards facilitating Living Services. To function, learn and evolve, a Living Service must be able to reference information from every part of the organization delivering it.

In addition, that organization or business must be able to draw in data from third-party sources such as social media or other service providers and integrate that information into its own cloud-based pool of data.

Using cloud-based data management systems will also help future-proof businesses. Providing access to information down through all levels of an organization will enable faster decision-making and stimulate creative solutions to business challenges.

This is particularly true for product innovation. If data access is democratized across an organization, teams in a position to be objective about a particular service or business unit are more likely to spot patterns in data that may help improve operations or even create a new service point. In short, cloud data systems will help businesses become more nimble, efficient and creative.

DATA AND ANALYTICS

As mentioned previously, the number of digital touch points creating data is rapidly increasing. Naturally, that means the data that is being generated is also rampantly growing, which is creating new and urgent challenges for analytics. The fifth element in the delivery of Living Services deals with both the data and analytics that such services create and use in a symbiotic fashion.

Even a simple visit to the grocery store can now include data captured via the loyalty program about preferences (a low-calorie diet, passion for Asian fusion recipes or a peanut allergy), visit intent (QR codes scanned) and even the type of customer journey each visit represents (store path captured via beacons).

To function, learn and evolve, a Living Service must be able to reference information from every part of the organization delivering it.

The sheer breadth of the data, not simply size, can create enormous challenges as the proverbial haystack gets larger with each question we ask. Designing with data in mind, captured in depth in Chapter 6, can help scope which data is needed to create a digital experience personalized to each individual and event. Yet, questions will still arise, such as why traffic in the store has declined this year versus last, which still need advanced analytics to solve.
As the data breadth grows, techniques such as pivot tables and traditional segmentation efforts will fail to tackle the data deluge. Instead, companies are turning to artificial intelligence to replace manual evaluations. Analysts will look back over many weeks with automated analysis that can evaluate millions of scenarios an hour with much greater depth. As we continue to gather data elements across sensors, mobile apps, social and ecommerce platforms and emails, the need for automated advanced analytics will continue to grow to meet that need.

In Chapter 6, we also discuss the need for designing for human bandwidth, which is critical given that consumers are wrestling with a growing number of choices. Analytics are not only critical for helping consumers find what they are looking for, but helping them do so with more confidence, less regret and more uniqueness. The latter is critical as consumers continue to express their niche preferences through the long tail of digital, yet can only do so if they can efficiently dig through the ever-growing digital assortment made available to them.

One key element often overlooked is the impact of Living Services on the operational side of the enterprise. Enhancing customer experiences, improving selling and marketing effectiveness, plus increasing brand equity are all readily accepted benefits. Yet, combining the supply and demand chains together and leveraging the ever-growing number of digital touch points also provides unprecedented business agility. In the past, excess inventory would often be sold at massive and untargeted discounts to the public, eroding margins, or even worse sold to a third party at pennies on the dollar. This often was the result of niche products that had trouble finding their target audience in traditional offline markets, which are dominated by a handful of high-volume products.

The enormous amount of data and advanced analytics not only enables finding consumers who would be most interested in the niche products, but also makes reaching them both extremely quick and very inexpensive. This allows for Living Services to not only have an impact on the demand side of the business, but to have a significant and measurable impact on operations in a manner not previously feasible.

The second field where innovations in user interface are blossoming is in the new emerging area of automation design.

USER INTERFACES
The sixth ingredient in the Living Services enabler mix is the evolution of user interfaces beyond a focus on screens and keyboards to play a more intimate yet less visible role in our lives.

The development of dynamic user interfaces will occur across different aspects of our work and day-to-day activities; we are already seeing the rise of natural user interfaces where physical interfaces and devices such as keyboards and pointing devices are replaced by parts of our bodies or our unique genetic makeup to get things done faster and more intuitively. In areas ranging from marketing to medicine, innovators are experimenting with how human bandwidth, from fingerprints to facial and voice recognition, can simplify everyday actions and even make clinical diagnoses. PayPal, for example, is using facial recognition linked to credit cards to
allow wallet-less transactions. Meanwhile, Aston University mathematician Max Little is working on a project to detect Parkinson’s disease, including the severity of symptoms from voice recordings, with an accuracy rate of up to 99%.

The second field where innovations in user interface are blossoming is in the new emerging area of automation design. Here we will see designers working closely with software developers and data scientists in order to focus on designing the algorithms which enable Living Services to adapt in realtime to meet human needs within a given context.

This ranges from offices automatically adjusting the heating and lighting or switching on a computer when an employee gets to work in the morning, to interaction with physical materials that are connected to the Web. These are known as Tangible User Interfaces (TUI).

Recent examples of user interface innovation include Sifteo Cubes, an interactive game system based on Siftables (developed at MIT Media Lab by David Merrill and Jeevan Kalanithi). Sifteo Cubes are small computers that display graphics on their top surface and sense one another and how they are being moved.

Another TUI system known as InfrActables allows the tracking of multiple input-devices on a front- or back-projection surface such as a desk or table. These devices, which could take the form of an electronic pen or pointer, are identified uniquely and their position, state (button presses) and orientation can be detected in realtime.

Many TUI systems are at an experimental, early market stage or have been applied to niche activities such as product design. However, their potential to transform the way we control physical objects or information or both together is already clear.

The wave of digital transformation we are now entering will usher in more and deeper change than we have seen in the first 20 years of digital.

HUMAN-ASSISTED LIVING SERVICES

In discussing Living Services it’s easy to get carried away with a scenario where human intelligence takes a back seat and sophisticated machines increasingly make automated, data-driven decisions. While the technologies listed above are crucial to the development of Living Services, humans will continue to drive the creation and delivery of smart digital services. Most Living Services will, in effect, be human-assisted Living Services, where human experts work with the algorithms to curate the choices to offer to consumers and to manage their experience of the service to ensure it flexes appropriately across different touch points to meet that consumer’s personalized realtime needs. Current examples of human-assisted digital services include Beats Music, which combines human curators and state-of-the-art technology to deliver tracks tailored to consumers’ realtime mood and location. Meanwhile, Trunk Club is a digital men’s clothing service where a human personal stylist handpicks a trunk of high-end clothes and ships it to the consumer. Similarly, Birchbox curates beauty and lifestyle products for consumers, offering monthly deliveries of beauty and grooming products tailored to consumers’ individual profiles.
A TRANSFORMATIVE FORCE IN SOCIETY

The fusion of our digital and physical lives has been discussed for years. The wave of digital transformation we are now entering will usher in more and deeper change than we have seen in the first 20 years of digital.

For good or bad—and people will have plenty of views on the desirability of all this—we now have the capability of making this a reality.

Thanks to their ability to embrace consumers’ lives and adapt to needs in realtime, Living Services will usher in a new era of personal service, similar to what was available to wealthy consumers in department stores and at home 100 years ago.

This doesn’t mean turning back the clock on 200 years of industrialization: One of the benefits of Living Services is that they will harness principles of mass production, creating and delivering products and services on a large scale. But by tapping into the capabilities of smart technology, brands and organizations will be able to deliver mass customization rather than generic services defined purely by economies of scale.

Businesses that know their consumers as individuals and gear themselves to continually flex their services to match people’s needs will remain competitive through constant innovation. The continual liquidity of consumers’ expectations will provide the pressure to do so.
02 CREATIVE DESTRUCTION: HOW LIVING SERVICES WILL CHALLENGE BUSINESSES
From transport to retail, from healthcare to utilities, every business must now be a digital business. The first two digital waves—desktop computing and mobile devices—have added layers of operational challenges to most organizations.

Some have become more efficient as a result. Others are still muddling their way through. The past 20 years has seen the rise of complexity go hand in hand with digital opportunity.

The arrival of Living Services opens up vast potential (and yet more challenges) for businesses, both in terms of commercial opportunities and in speeding up and simplifying internal processes and operations, but also in transforming and reinventing the products and services they supply.

Are established businesses structured in a way that enables them to embrace the commercial and organizational benefits of Living Services? While the first and second waves of change disrupted how businesses operated, they also began to challenge silo-based corporate structures as an organizational principle in most large corporations. The third wave and the design requirements of Living Services (know your customer, flex your technology, design what you need to flex and know) will usher in a period of accelerated digital transformation for companies that looks likely to signal an end to traditional organizational structures.

As boundaries blur between physical resources and digital assets, new internal divisions will probably emerge within many companies. They will be forced by necessity to rethink organizational structures that are based either on product categories or clearly defined roles such as production, sales, marketing, IT, distribution, research and development.
CHALLENGE ONE: LIVING OPERATIONS

Over the course of a year or two, because of its nature, a Living Service is going to dramatically change—moving, shifting and molding itself around the user. In order to construct a Living Service and have it connect with its constituents, customers, clients or employees, there needs to be a concerted force or operation behind it. This kind of operation cannot be fixed in the way that many organizations are used to, so we need to consider the concept of a ‘Living Operation’ too.

The problem is, moving, shifting and molding are not the sorts of things many large organizations are well-attuned to doing, so a radical shift in business and organizational culture will be crucial. Senior managers will need to regularly ask themselves whether they’re taking the necessary operational steps to drive a Living Service forward, rechecking and revalidating on a weekly and monthly basis, not yearly.

Approaching functions in an overly ‘siloized’ way, and prioritizing efficiency for efficiency’s sake will need to be replaced with a far greater degree of flexibility. Equally, as organizations allocate their budgets at the end of the year, there will need to be a proportion designated for functions that we haven’t even considered yet, taking into account the rapid organizational evolution Living Services will necessitate.

Another important part of this cultural shift will involve employees being given more responsibility and the skills required to respond to the demands of a living operation. Instead of telling employees what to do, senior managers will need to put in place key principles and guiding lights and allow them to act according to their intuition, making sure their workforce has the necessary capabilities. Priorities must shift toward sensing versus procedure and having intuition versus needing instruction.

Some companies are already showing how living operations might be maintained through a more flexible approach to corporate structure and the products and services they offer to their customers. Take Nike, for example, a company that’s changed dramatically since it first launched its Nike+ tracking device in 2006. Originally intended as a sensor embedded into the shoe, the project has morphed into the wrist-worn FuelBand and accompanying app, taking Nike deeper into consumer electronics and the Quantified Self movement.

Priorities must shift toward sensing versus procedure and having intuition versus needing instruction.

If you look at the arc of change in its service from 2006 through to 2014, the types of capabilities and functions Nike would have to have built in-house, particularly around realtime analytics and data visualization, let alone cross-platform experience support, have spurred a dramatic shift in the company.

Equally, look to IBM and its transition from hardware to software; Apple developing world-leading expertise in chip manufacturing, when only a short time ago it had none; or Google’s expansion into driverless cars through its Google X Life Sciences division. It’s this principle of maintaining a clear north star, but not being too prescriptive or rigid in how you get there, that will be essential for all...
organizations in a world dominated by Living Services.

CHALLENGE TWO: EMBRACE CONTINUAL DESIGN
The focus of conventional business strategies developed in the 19th century and propagated throughout the 20th century is to build a profitable business based on selling products against long-established needs. Soap-powder brands will constantly innovate, producing new product variants, but ultimately they’ll continue to deliver a mass-produced product category that has been around as long as washing machines. As a result, their business is structured to deliver this mass-product as efficiently as possible. It makes sense (for now) to have specialized business silos to deliver a product that is designed once and then delivered.

But what if your product is constantly being designed? Not just every year, but every day, hour or minute? To deliver such a product, your business must be geared to constantly follow and interact with people across every part of their journey or relationship with that service. This will require a significant change in the corporate mindset.

CHALLENGE THREE: REINVENT YOUR MARKETING—INTRODUCING THE CXO/CDO
One striking example of how Living Services will require businesses to change is the growing fusion of the roles of chief marketing officer (CMO) and chief information officer (CIO) traditionally charged with IT operations.

From today’s conventional sales and marketing point of view, the concept of Living Services can appear challenging.

Dynamic services are designed to adapt, evolve and pivot around customer experience rather than around visual brand consistency or product sales. They willfully connect a consumer with other brands that may be convenient to the customer. They do not attempt to force consumers to use a full stack of service options. Meanwhile, branding should not stand in the way of enabling consumers to achieve the best value.

Disney’s visitors are always by nature exceptional, not routine. Disney has invested $1 billion enriching the theme park experience through implementation of wearable technology like the ‘Magic Bands’.
This fusion is already apparent in the corporate world. Cosmetics retailer Sephora has taken a lead in the integration of its digital marketing efforts into its overall operational strategy and has a single executive who serves as both chief marketing officer and chief digital officer. Sephora’s approach has been to establish digital strategy at the highest level of business planning and to ensure that marketing and IT teams are operating as teams with a single focus: to achieve continual evolution of the consumer experience.

Meanwhile, Zappos, the online shoe retailer owned by Amazon, has broken down decision-making silos across customer service teams, enabling each customer service agent to act autonomously to deal with customer problems. Likewise, customer interaction systems prioritize individuals rather than categorizing them by complaint or query type.

Research by Accenture Interactive (2014 CMO-CIO Alignment survey), states that CMOs and CIOs say they are working more collaboratively than in the past to take advantage of digital opportunities.

Surveying more than 1,100 marketing and senior IT executives across the globe, Accenture Interactive found that 43% of marketers and 50% of IT leaders think their relationship with the other has improved over the past year. But companies still need to work hard to bridge the gap, and the delivery of Living Services will make this an imperative and act as a catalyst to hasten change.

**CHALLENGE FOUR: UNDERSTAND YOUR CUSTOMERS AND ANTICIPATE THEIR NEEDS**

Living Services are inherently consumer-centric; they flow from the question “how can we improve consumer’s lives?” rather than “how can we sell our clearly defined product more profitably?” This is what startups offering the first breed of Living Services understand so well. Their business models are based on identifying a specific consumer need and designing a solution in an elegant way by producing services that consumers appreciate and begin to find indispensable.

Zappos, the online shoe retailer owned by Amazon, has broken down decision-making silos across customer service teams.
For example, If This Then That, understands that consumers might want to connect their favorite apps by moving content from one service to another, such as moving photos on their Instagram account into their Dropbox. The service is transformative in that it saves its users time and effort. Meanwhile, Evernote anticipated how the increasing complexity of digital lifestyle makes it hard for consumers to remember things and stay organized across a range of devices. In reinventing personal organization for the digital age, Evernote is also affecting a small transformation in the lives of its customers. Indeed, Evernote’s ambition level goes way beyond this to “make you better at everything.” What all these digital startups have in common is a deep understanding of their customers and (initially) small but significant ways in which they can add value to their lives.

Google and Amazon are two examples of established companies poised to take a lead role in Living Services with offerings such as virtual assistant Google Now and Amazon’s anticipatory shipping patent. Both have embedded customer understanding and anticipation of their needs at the core of what they do. Companies wishing to emulate their success should take note.

**CHALLENGE FIVE: BUILD TRUST**

A further challenge for existing organizations looking to evolve their business models through Living Services is that they require brands to get very close to consumers, to the point where they are seamlessly blended into people’s lives.

This requires trust and an approach to customer services and dialogue that truly puts the client first. However, trust is a commodity that many large institutions, such as banks, utilities and energy companies, have struggled to grow and maintain.

Building or rebuilding this trust to the point where consumers believe organizations have their best interests at heart will require a long-term, concerted effort where marketing and PR are matched by real actions and a realignment of corporate priorities.

**CHALLENGE SIX: TACKLE COMPLEXITY**

Coming hot on the heels of the desktop computing and mobile waves, the emergence of Living Services introduces yet another layer of complexity for businesses wishing to exploit the opportunities that this latest wave of digital disruption offers. What’s more, the complexity comes from many sources:

- As the number of smart devices proliferates, customer touch points are multiplying all the time. Customers don’t just expect, they increasingly require a consistent fluid service experience across a growing number of touch points.
- The challenge for businesses transitioning from a one-size-fits-all or lowest-common-denominator approach to service experiences, to highly personalized services introduces considerable complexity into the design process.
- The growing web of sensors and rapidly expanding data creates the need for businesses to make sense of the data and transform it from pure data into knowledge, insights and appropriate action.
- The traditional, silo-driven structure of organizations that launched in the pre-digital age often results in a fragmented customer experience instead of a fantastic one.
Organizations must tackle complexity head-on in order to enable customers to have seamless and delightful experiences. They must invest in systems that help prioritize and simplify processes and must obsess about customer value in order to deliver a consumer experience that is elegant and simple.

**CHALLENGE SEVEN: AIM FOR NOTHING LESS THAN TRANSFORMATIONAL SERVICES**

In the 1999 influential book, *The Experience Economy,* authors B. Joseph Pine II and James Gilmore heralded the arrival of a new era in which it would no longer be enough for companies to offer consumers products and services. To truly differentiate themselves from their competitors, connect with customers and build loyalty, businesses would have to offer consumers memorable experiences.

The concept may have been conceived 15 years ago, but it is only now that we are in a position to bring this transformative idea to fruition.

Pine and Gilmore used a five-tiered pyramid to illustrate the upward progression of economic value they were describing. The pyramid showed a progression from commodity at the bottom (lowest value, high volume), up through brand or product, to service and then to experience. They opined that the economic winners of the future would create experiences. But they took the theory one stage further—at the top of the pyramid was ‘transformation.’ Experiences that transformed users would have the highest value (and be the rarest) of all.

While the concept of a product or service being transformative can sound somewhat messianic, the transformation need only be very small. For example, Nespresso’s Zenius machine uses SIM card technology to remotely connect with the customer relationship centers to reorder coffee capsules. This provides proactive services that react to the machine status and coffee consumption.

When it comes to making a difference to consumers’ lives, coffee capsules may not seem like a big deal, but imagine the collective impact hundreds of smart objects and devices we encounter every day could have on our lives.

The music and media industry is a case study of what can happen when multiple transformative innovations emerge. Between 1999 and 2009, Forrester Research reported music industry revenues in the U.S. dropped from $14.6 billion to $6.3 billion. This rapid erosion began with the emergence of Napster and other free music file-sharing services and continued with the arrival of iTunes and other paid online music services. In the space of a decade, consumers had shifted wholesale from hard copy music, bought in stores, to online music services.

In the TV and film industries, the growth of streaming services such as Netflix and Amazon Prime Instant Video, as well as the rapid growth of online video is also causing disruption to linear broadcast models, film-viewing habits and DVD sales.

In the music industry, a further wave of services such as Spotify is changing people’s consumption of music by enabling users to access a vast pool of recordings wherever they are without the need for hardware storage. Spotify has also atomized its service to make it available through multiple access points rather than a single brand entry point. In other words, Spotify has expanded the range of music people can access and is removing the barriers to doing so and is genuinely transformative. Established companies are also starting to
experiment with the concept of experience transformation. Train travel is arguably a commodity service; however, French train company SNCF is starting to offer its passengers end-to-end journey management by providing a car for consumers on their way to and from the railway station. By doing this, the rail operator is not just adding a service, it is arguably transforming the entire journey experience.

Similarly, taxi app Uber has revolutionized the taxi and minicab sector by connecting passengers with available taxis and vetted minicabs in their immediate area. Customers needing a taxi can use their smartphone to book one in their vicinity, sparing them the hassle of calling for a cab or hailing one in a street. Payment happens automatically via a credit/debit card when customers register for Uber, therefore saving passengers the trouble of a cash transaction.

Pine and Gilmore were particularly prescient in that they understood that the Web would drive beneficial experiences and transformative services, albeit without predicting the technology that would enable this shift. The technology is now available to make this happen.

Living Services sit at the top of the experience economy pyramid. They are, by definition designed to be transformative, opening up opportunities for a vast range of improved experiences in the same way that the arrival of the Internet opened up huge opportunities for enterprising businesses to disrupt and challenge traditional business sectors.
03
A BRAVE NEW WORLD FOR BRANDS
As the digital revolution continues to accelerate, brands face major challenges when it comes to attracting and keeping consumers’ attention and loyalty. Consumers are becoming digitally dizzy, as they experience a proliferation in digital touch points and services to engage with and have limited time in which to interact with them.

Brand owners can look to British anthropologist Robin Dunbar, who discovered that there is a limit to the number of people with whom we can maintain meaningful social connections. Dunbar maintains that in societies across the world, that limit is 150. Anything above this number and relationships stop being meaningful or authentic.

**SO WHAT DOES THIS MEAN FOR BRANDS?**

It is highly likely that there is a Dunbar number for the maximum number of brands consumers can relate to in a meaningful way. This is certainly the case with mobile apps if recent research by Nielsen is anything to go by. Nielsen tracked app usage of U.S. Android and iPhone users for two years and found that while time spent on mobile apps increased by 65% over that period, the number of apps they engaged with remained consistently static at around 25.

With this in mind, brand owners need to be highly self-critical to determine if they are genuinely interesting enough to earn and keep consumers’ attention in an increasingly connected and always-on world.

What’s more, as Living Services start to change the dynamic between customers and brands, from one that is based on intrusive marketing and isolated transaction points to one that is more consumer-centric and relationship-based, brands will need to start mapping where they stand with individual consumers.
Fjord has created a Dunbar number map for brands (see above) that divides consumers' relationships with brands into one of four quadrants:

1. Brands that I love that I don’t often engage with
2. Brands I love and engage with often
3. Brands that I don’t love that I don’t often engage with
4. Brands that I don’t love but engage with often

It’s important to note that each consumer’s map will be different and constantly shifting as her relationship with brands changes.

If you accept there is a Dunbar-style limit to the number of brands or organizations that consumers can feel affectionate towards, the map poses interesting strategic questions including:

- Which quadrant can my brand realistically expect to be in?
- Can my brand move towards the desired quadrant?
- How do I deal with consumers who place my brand in more than one quadrant?

Although the map is individual to each person, on-balance digital brands are more likely than non-digital brands to inhabit the second quadrant: brands that I love and engage with often. Millward Brown’s BrandZ Top 100 Most Valuable Global Brands study 2014, for example, placed Google and Apple, both digital brands, in the No. 1 and No. 2 slots, ahead of brand giants such as McDonald’s.

Our love for digital brands is partly a simple result of frequency and proximity.
Our phones are close to us and give us immediate access to digital brands such as Evernote or Instagram.

**SO HOW CAN BRANDS MAKE CONSUMERS SHORTLIST THEM?**

Personalization and purpose are key for brands to win consumer affection in this digital age. The good news is that the sophisticated, realtime technology powering Living Services has the capability to meet the individual needs of consumers. Of course, meeting that potential needs know, flex and design.

Brand owners who spend time really getting to know their customers and who embrace Living Services that are individually customized to their consumers' needs will have the best chance of occupying the second quadrant on the Dunbar number map, where not coincidentally most profit lies.

But should this offer be a product or a service? The answer will vary from sector to sector and from brand owner to brand owner. One broad trend worth being aware of is that, as brand owners seek to grow and extend their relationships with consumers, the boundaries between product and service are blurring. After all, selling products to consumers tends to revolve around single transactions without offering much opportunity for brands to build a relationship with them.

By contrast, selling a service involves a value exchange over time; consumers pay to get something that they can access for the duration of the contract. Of course, different types of services prompt very different levels of contact. Currently, few people talk to their utility companies unless they are changing suppliers or have a problem, while social media or entertainment channel access is continual.

Brand owners who are traditionally and purely product-focused are increasingly seeing the need to offer services that can extend the longevity and perceived value of their products, as well as forming the foundation for an ongoing relationship with the consumer.

**EVERY PRODUCT IS A SERVICE WAITING TO HAPPEN**

The digital revolution has already empowered brand owners of all types to be much more innovative about how they build and sustain relationships by providing a wide range of channels for communicating with consumers and facilitating much greater interactivity and personalization. Within this context, extending a product into a service is much more straightforward than it would have been in pre-Internet days.

The trend of toys connected to services that grow and evolve as children grow is one that is likely to gather momentum.

Within the toys and gaming sector, Disney leads the way when it comes to diversification in the digital space, by creating digital experiences around its physical products with online gaming in the form of Disney Infinity. Toys R Us followed suit with the (now-defunct) ToysRUsmovies.com, a family focused media streaming service. Meanwhile, toy brand Hasbro has teamed up with 3D printing marketplace Shapeways to launch Super Fan Art, a website that allows fans to create and sell 3-D designs based on Hasbro brands, including My Little Pony, Transformers,
Monopoly and Scrabble. The trend of toys connected to services that grow and evolve as children grow is one that is likely to gather momentum.

The arrival of Living Services will see breakthrough services (those that consumers really love and use frequently) fall into one of two categories. The first category is likely to include traditionally product-focused companies such as Nestlé, HP and Nike mashing their existing brand clout, resources and know-how with new technology and innovative startups to meet their consumers’ needs in completely different ways. Daimler, owner of Mercedes-Benz, is a good example here. The luxury car marque is addressing the dual problems of declining car sales/traffic congestion in towns and cities with its moovel mobility platform, which enables customers to compare the prices and journey times of a range of different transport options such as car2go, public transport, taxis, rail, ride-sharing and even rental bikes. The company recently expanded this offer by acquiring taxi booking app mytaxi and North American ride-sharing app RideScout. In a completely different field, notebook brand Moleskine has found a way to bridge the gap between its analogue world of beautiful notebooks with consumers’ growing need to record and store notes digitally. The company has teamed up with smart pen manufacturer Livescribe to launch a range of Livescribe Moleskine notebooks, which allows users writing with a Livescribe smart pen to record handwritten notes and images digitally to their phone or laptop via a Livescribe app.

The second category will feature new brands born of the digital age ferociously challenging the established players. Think Uber, Airbnb, JustPark and bike, ski and snowboard rental site Spinlister for the latter case; all of the former have dispensed with creating products at all—the product is the service. They have identified the services that people need and developed the infrastructure to connect them to that service in a highly tailored and engaging way.

There is a word of warning, however. In the rush to move into providing ‘services,’ brands—both established and new—need to

RideScout, a North American ride-sharing app.
ensure they are developing something that genuinely adds value as opposed to merely amplifying the virtual noise and clutter of consumers’ lives.

In the always-on digital world, the companies that are best placed to benefit from the opportunities Living Services present will be those that deliver the right value at the right time and place to connect with, help and delight customers.
04 WHERE WILL LIVING SERVICES EMERGE?
The transformative effect of Living Services will eventually have an impact on all areas of our home and work lives as consumers and organizations start to rely on their capability to continually learn and adapt to a realtime context and automate decision-making.

So imagine being able to monitor and manage many important aspects of your own physical and mental health that previously were left to your GP or physician. And imagine communicating with your home from anywhere in the world—to monitor security and remotely control any appliance you like, from checking the heating is switched off to making sure your favorite show is set to record. Or how about the enhancing effects of Living Services in the office, where advanced performance data could help managers to make better operational decisions and help employees better manage their workloads and stress levels? Living Services are likely to bring huge benefits to all these areas and many more.

Here we examine nine areas where Living Services are already starting to emerge: health and wellness, car, travel and hospitality, media and entertainment, education, our homes, shopping and finally our cities, workplace and industry. This, of course, is to identify Living Services by notionally independent environments, but over time this will be increasingly hard to justify as barriers merge and traditional categories become meaningless.

SERVICING THE MIND AND BODY
Living Services will have a profound impact on health and wellness, enabling the shift from reactive treatment of issues to proactive prevention of problems, and a simultaneous shift from population-based diagnostics and prescriptions to those based on individuals. The concept of appointments at doctors’ surgeries and hospitals as we know them will shift, as Living Services will enable both consultation and care to expand into your living room. Advances in technology will allow us to take far greater responsibility in monitoring our own health and
managing long-term medical conditions.

This healthcare revolution will occur from two directions. The Quantified Self (QS) movement started in San Francisco in 2007 and has been adopted by an enthusiastic minority across the globe. We will see QS grow into a mainstream trend, as wearable health monitoring and sports technology become more widely accepted and accessible through lower prices and availability (notwithstanding recent skepticism over wearables and QS from some observers). In Fjord’s view, the gradual accumulation of awareness of the personal and private benefits, plus better devices and design will lead to breakthrough. The Apple Watch, with its inbuilt health sensors, looks poised to take QS over the watershed.

After all, it’s not like we aren’t interested. Studies by Pew Research Center’s Internet & American Life Project on self-tracking in the US reported 60% of U.S. adults track their diet, exercise or weight, while 33% track their blood pressure or glucose levels, and 21% use technology to do this tracking.

As the collection of personal health data becomes a part of everyday life, operating often in the background, we will begin to expect health professionals to look at this information and use it to assess our general health and spot irregularities to identify potential issues.

Globally, people are living longer and getting fatter. This is a major issue for healthcare providers and governments. When this is coupled with rapidly growing healthcare costs and our increasing demand and high expectations for smart medical technology, it creates a delta. The gap between what we expect and what societies can afford is widening each year.

As of the date of this report, more than 1 billion people in the world are overweight and at least 600 million of those people are clinically obese. This is having a huge impact on long-term health conditions, in particular diabetes, heart disease and chronic obstructive pulmonary disease.

**Advances in technology will allow us to take far greater responsibility in monitoring our own health and managing long-term medical conditions.**

Within the EU, people aged 65 years and older will account for almost 30% of population by 2060, up from 17.4% in 2010. Healthcare providers are going to be pushed to the limits.

There is a growing imperative from the top down to revolutionize the way in which healthcare is delivered to citizens. Digital technology has the potential to tackle the gap between our expectations and the affordability of meeting them. With it, the onus shifts towards enabling the public to track and improve their health through simple and engaging tools.

In order to make this information meaningful, local medical practices and hospitals must create systems to receive personal health data, distribute it and coordinate necessary action. This has the potential to be incredibly powerful, and existing businesses and innovative startups have the opportunity to claim their place in this space.

Currently, the consumer technology industry is leading the charge towards health-orientated Living Services. Advances in digital technology are transforming mobiles, watches
and wristbands into realtime, personalized, portable health monitors.

The potential for ‘smart’ health is evident from the explosion in mobile apps. There are already more than 100,000 health and wellness apps available worldwide. Figures from Nielsen suggest there is real consumer demand for these apps with almost one-third of U.S. smartphone owners (about 46 million people) using health and fitness apps on average 16 times a month. Meanwhile, Acquity Group’s 2014 Internet of Things study, which surveyed 2,000 US consumers, found that 7% of consumers own a wearable tech device. This figure is expected to quadruple by 2016, when 28% of consumers are expected to adopt wearable tech. Acquity Group’s report also forecasted that wearable fitness applications and technology will see the fastest rate of take-up, with 33% of consumers planning to adopt wearable fitness devices in the next five years.

This reinvention is defined by the shift from offering purely physical products to the creation of a package of interlinked products and services geared to the individual customer. The wellness space is currently dominated by companies with a vested interest in fitness. Sports brands such as adidas’ miCoach Range, Reebok’s head impact sensor CHECKLIGHT, or startups like Fitbug, Withings, UP by Jawbone and Fluxstream are part of a wholesale reinvention of the fitness and wellbeing sector.

This reinvention is defined by the shift from offering purely physical products to the creation of a package of interlinked products and services geared to the individual customer. It’s striking that Nike, having built its brand on sports and lifestyle apparel, should venture into wearable fitness technology in the form of fitness tracker FuelBand and smart sports watch Nike+, only to shift its focus again away from hardware to service-orientated software (we expect to see Nike build on Fuel through third-party devices such as the Apple Watch).

Google and Apple are also keen to get a slice of the action by developing fitness platforms such as Google Fit and Apple HealthKit, which allow users to control their health and fitness data across a range of apps. This allows apps featured on the platform to share the user’s health and other data (with the user’s permission). Apple’s HealthKit is also being tested in some of the U.S.’s top hospitals in a pilot service where doctors are using it to collate data and monitor patients remotely. We are likely to see more non-health and wellness organizations try to enter this space as consumers and the economic pressures demand a solution to obesity and other preventable diseases.

In the healthcare sector, technology companies are also developing innovations that can monitor serious and minor ailments. Diabetes is a particular focus of attention. There are currently 387 million...
diabetics worldwide today, a number that is expected to grow to 592 million by 2035. Sensionic has created a connected glucose monitoring device based around a miniature implant that sends data to the user’s mobile phone. The company plans to develop a long-term continuous glucose monitoring system.

Similarly, LabStyle Innovations Corp. has developed an app and Web portal for personal glucose monitoring that lets the user track a personal archive of data, as well as recording food intake. The system, called Dario, also shares critical data in real-time with carers. Meanwhile, Google and Novartis have built a smart contact lens for diabetics, which monitors blood glucose levels detected through tear fluid.

Google and Novartis have built a smart contact lens for diabetics, which monitors blood glucose levels detected through tear fluid.

Helping to address the psychological impact of diabetes, Ginger.io is an app that can predict signs of depression up to two days before outward symptoms manifest. (There is a high correlation between diabetes and depression.) The app works by tapping into data from a patient’s smartphone in order to record everyday behavior, allowing it to pick up on patterns and alerting healthcare providers of early warning signs.

Similarly, researchers at the University of Michigan are developing a smartphone app that monitors subtle qualities of a person’s voice during everyday phone conversations in order to detect early signs of mood changes in people with bipolar disorder.

Health and wellness apps are even extending to help monitor the health and wellness of unborn babies. Bellabeat is a ‘connected system’ that enables expectant mothers to monitor their own health and that of their unborn child. It includes a small device that attaches to an iPhone or Android smartphone and allows the user to hear, record and share her baby’s heartbeat and track other aspects of their pregnancies, such as weight gain and how often the baby kicks.

Through smart mobile technology, individualized healthcare can be administered more efficiently and more effectively. It creates the possibility for more accurate diagnoses and more immediate intervention, a major market opportunity of which companies are already rushing to be a part.

While the potential benefits are huge, the logistics of creating universal standards and platforms through which telecoms and healthcare companies can work are significant. GSMA, the organization that represents the interests of mobile operators worldwide is working to align the industry with healthcare service providers.

Telecom brands are already actively looking at the healthcare market as part of a strategy to enable them to move away from selling data services to selling connected living lifestyle services.

Those with a more long-standing interest in healthcare are also looking at Living Services in this area.

The pharma sector is increasingly using the term ‘beyond the pill’ to describe an ambition to create health services around medication.
Currently, the consumer technology industry is leading the charge towards health-orientated Living Services with fitness trackers such as UP24 by Jawbone.

products and programs. According to a 2012 Manhattan Research survey carried out in the U.S., 30% of patients and 38% of care-givers are interested in registering for a patient support program that would give access to a range of support services from pharmaceutical companies.

Through smart mobile technology, individualized healthcare can be administered more efficiently and more effectively.

Within the U.K., the National Health Service (NHS) is beginning to envisage the use of remote monitoring, enabling more patients to remain in their homes rather than being admitted repeatedly to hospitals. In a recent radio interview, Sir Bruce Keogh, the medical director of NHS England, explained how mobile phones could hold the key to patient monitoring.

Swiss scientists have developed an implantable diagnostic chip capable of analyzing blood, testing for up to five different molecules (such as glucose and lactate) and delivering data to a doctor in realtime. The chip is designed to monitor for general health but could also be used to assess the impact of drugs given to a patient so that they can be precisely tailored to his or her needs. Looking forward, the team hopes its chip will be capable of testing for multiple diseases.

This is just one example of the rise of sensors that can be embedded in the skin in order to track a patient’s vital signs around the clock. Another area of innovation is sensors that monitor how ingested medicines are performing for patients. For example, Proteus Biomedical's digital medicines feature a stomach-activated sensor that provides information on how
the patient is taking and responding to medication. This is an example of a true Living Service already in action.

To tackle diseases where treatments and cures are still in development, Living Services could play a dual role in research and treatment. Intel and the Michael J. Fox Foundation are developing sensor technology and analytics platforms with the ambition to treat and better understand Parkinson’s disease. The project will see participants carrying wearable sensors 24 hours a day, capable of delivering more than 200 data points per second.

Even as technology and data collection improve, there will be many logistical and structural bottlenecks that will slow the sector’s ability to embrace change. For example, even if laboratory test results can be delivered to the patient in a couple of hours, doctors may not be able to review and read these in the same time frame.

Another broad challenge to the development of Living Services within the health sector is regulation of service delivery and also patient data. This is a fundamental problem and will require long-term consultation and experimentation to solve. Various solutions and standards will emerge in different markets but, ultimately, regulators, healthcare providers and technology services will be progressively nudged towards personalized health management by cost pressures, improving technology capability and by consumers.

**TOP GEAR: THE CONNECTED CAR EXPERIENCE**

Living Services promises to radically change the driving experience, turning your car commute from a time-wasting and frustrating experience to one which is productive and entertaining in equal measure. First, you’ll be far more likely to arrive at your destination on time because your car will know about traffic and driving conditions and will inform you of an appropriate time to leave. Passengers will have the option of delegating the driving to the car, which will likely be more fuel-efficient and safer, reducing the costs of

As cars become automated, consumers will expect them to be integrated into broader life-management services.
car insurance premiums, thanks to safe and environmentally sound driving. If you wish, your car can provide detailed information about your destination, about the landscapes you travel through, and naturally it will match your purchasing preferences with timely offers on your route.

With innovation core to their business proposition and a relatively regular purchasing cycle, motor manufacturers have been keen to explore the possibilities of integrating smart digital technology into cars to enhance driver and passenger experiences.

The connected car is, in effect, a new digital platform within consumers’ personal digital service ecosystem. Connected cars will need to act like and interoperate with other touch points such as PCs, smartphones, tablets, wearables and their associated services. Just like mobile apps, people will want to personalize the internet-connected services within the car, so control over personalization will become an ongoing part of the ownership experience. Google, Apple and Microsoft have all started to move into this market, with car brands lining up behind different services (see box on page 42).

However, the transformation of the automobile industry through Living Services is not as simple as enabling the occupants of cars to access apps and emails. The evolution of the sector will be far more profound.

There are several ways in which Living Services could shape the future of cars and driving. The first is the arrival of autonomous or semi-autonomous vehicles. Driverless cars could be as revolutionary in terms of their impact on society, lifestyles and economics as the invention of the first petrol-driven automobiles. Nissan says it will be able to deliver a mass-market driverless car by 2020, with Google aiming even earlier at 2017.

As cars become automated, consumers will expect them to be integrated into broader life-management services. We will, in effect, expect our other Living Services to step into the vehicle with us.

The connected car is, in effect, a new digital platform within consumers’ personal digital service ecosystem.

Universal connectivity means that in the future, our cars will have access to our personal data, preferences and content. And as such, our data and the accompanying services won’t be fixed within one vehicle, but will travel with us using cloud-based exchanges so we can access the same content and information whether we are in our own vehicle or a rented one.

The second transformational development for cars concerns the very idea of car ownership. For significant numbers of consumers, particularly younger, urban demographics, cars could come to be seen more as a service or experience than a product to own. Services such as Zipcar and BlaBlaCar illustrate our changing mindset.

Whether it is renting a specific car type for a specific role (a small, fuel-efficient car for the city or a convertible for a touring holiday), borrowing cars short term, or sharing longer term the way in which consumers access cars could change dramatically.

As we are seeing in the fitness sector, car brands could develop Living Services
geared not around selling vehicles to permanent owners, but on facilitating lifestyle requirements or temporary needs. The brand relationship becomes more about delivering the particular type of driving experience or practical capability than about ownership.

**Driverless cars could be as revolutionary in terms of their impact on society, lifestyles and economics as the invention of the first petrol-driven automobiles.**

The flow of realtime data to and from connected cars means traditional service providers such as insurers and maintenance and breakdown companies can extend and deepen their relationship with consumers.

The number of sensors being built into cars is increasing. Every major component—engine, tires, braking systems, air conditioning, lights and control systems—are becoming connected, along with sensors covering speed and driving behavior, location, weather conditions, road surface and traffic in the immediate vicinity. These will provide a wealth of data that can inform service providers about the status of the car and behavior of its occupants, what’s happening right now, what might happen and the best options to avoid problems and to help consumers save time, money and become more energy-efficient. For example, premium electric car manufacturer Tesla has developed *Smartcar*, an in-car app that helps drivers to reduce their electricity bill by optimizing energy use while driving the car, as well as avoiding peak-hour rates when recharging. The learning system adapts to the driver’s behavior for a more personalized driving experience, such as knowing when to heat up the car on a cold morning before a commute.

And early evidence suggests that consumers are open to the idea of sharing data from their cars in return for rewards. Acquity Group’s 2014 Internet of Things study reveals that 60% of consumers would be prepared to share data with their car’s manufacturer if offered a free maintenance session.

Car manufacturers have been quick to capitalize on the potential of digital services to improve their service to clients. Mercedes-Benz’s diagnostics service, mbrace2, enables users to check on the performance or mechanical status of their car through a mobile app. Mbrace2 can help make service appointments and send realtime alerts to a monitoring center if a fault or puncture occurs on the road. This data, along with the precise location of the car, is then passed to breakdown services.

The potential is also there for the emergence of a whole new level of external location-based information that can be accessed from within the car. For example, travel and tourist information as you drive toward a region, or service stations offering e-coupons or loyalty points to lure travelers to stop by (imagine an automotive-based version of U.K. carrier O2’s successful Priority Moments). Or consider the benefits of a realtime, location-based info-ainment service from, for example, the U.K.’s National Trust. Again, Acquity’s report highlights that more than 50% of those surveyed would share data from their car if offered coupons and discounts based on frequently used routes or current location.

From reduced fuel consumption, increased freedom for the elderly, reduced congestion, pollution and increased speed limits, to the impact on rail and bus networks and taxi firms, not to mention the huge potential for work...
efficiency, the potential for Living Services to completely change our relationship with the car and the experience of driving is profound.

Volvo is currently trialing test vehicles on Scandinavian roads, which are able to automatically communicate realtime data about road conditions to each other and road administrators. The testing is being undertaken in conjunction with Swedish Transport Administration (Trafikverket) and the Norwegian Public Roads Administration (Statens vegvesen). Volvo’s test cars detect icy or slippery conditions plus road friction and transmit that information via a mobile phone network to Volvo Car’s database. Warnings are then transmitted to nearby vehicles, and a slippery road warning on the instrument cluster alerts drivers approaching the hazard to take appropriate action. An alert is also sent to road maintenance authorities to help improve the management of dangerous conditions.

For significant numbers of consumers, particularly younger, urban demographics, cars could come to be seen more as a service or experience than a product to own.

CHANGING THE TRAVEL EXPERIENCE
But it’s not just cars that will be changed by Living Services. The broader sphere of travel and hospitality will be transformed in the next 10 years. Some of this will be driven by the reinvention of cars, initially connected and then autonomous. If drivers are no longer required, and cars can become places where you sleep or are entertained in during long journeys, then they will introduce a new level of experience competition with trains, buses and airplanes. Why suffer the hassle of getting to a terminus, security checks, possible delays and crowds when you can get in the car with your family and be entertained all the way to your eventual destination?

Copenhagen airport wanted to provide enhanced passenger experience and improve efficiency of airline operations.
PIT STOPS AND CHICANES - THE PLATFORM RACE TO DELIVER CONNECTED IN-CAR SERVICE.

Connected digital technology is already being integrated into most new cars and for good reason. There’s growing evidence that people consider digital connectivity to be as important as driving performance.

A recent international consumer survey carried out by Accenture, which included 14,000 drivers in Brazil, China, France, Germany, Indonesia, Italy, Malaysia, South Africa, South Korea, Spain, the U.K. and the United States, found that in-car technology options could outweigh performance in purchase decision-making.

Some 39% of the drivers said their primary consideration in choosing a new car is in-car technology, compared with 14% who said driving performance had the greatest influence on their choice.

The in-car technologies being considered included navigation and traffic services; a range of autonomous driving aids; in-car services, including entertainment, work tools and learning; safety services; black box-type monitoring of a person’s driving patterns that can help reduce insurance premiums; and a number of passenger-related services.

Currently, however, in-car services are a mess of brand allegiance and compatibility issues. There is little cooperation and some car manufacturers are lining up behind multiple systems.

Apple’s system, CarPlay will be incorporated into 40 new car models made by two dozen major automotive manufacturers, including Ferrari, Mercedes-Benz and Volvo. CarPlay can power the car’s navigation system, place calls and read messages aloud to the driver. Other car brands such as Honda, Ford, BMW, Citroën and Toyota have said they will work on integrating this system into future vehicles.

Meanwhile, Google has looked to Android to power its in-car system called Open Automotive Alliance (OAA). Google’s approach has been not just to install Android from the phone into the car, but tailor it to a complete in-car experience.

Some car manufacturers, such as Honda, Hyundai and General Motors, say they will work with both Android and iPhone smartphones, although perhaps not in the same car.

And then there’s Microsoft’s Windows Embedded Automotive 7, which was the latest incarnation of Microsoft’s in-car technology. It’s behind a number of in-car systems, the best known of which is Ford’s SYNC system.

Meanwhile, Nokia’s location technology platform, HERE, is widely regarded as the market leader in providing the mapping inside cars, and over the past few years, it has focused ruthlessly on reinventing what maps mean and their contextual capability.

Founded by BMW, Intel and General Motors, among others, GENIVI Alliance wants to push an open-source development platform for cars, while Connected Car Consortium has MirrorLink, which is a system that displays a smartphone’s apps and functions onto a car’s screen and is controllable either with buttons or a touch screen.

These systems are not yet true Living Services, but are certainly significant steps toward facilitating them. To create true car-based Living Services, brands will need to use the in-car infrastructure they are building and join the dots between individual customer data and support services such as insurance and maintenance.
It’s another example of liquid expectations in action and will force airports, airlines, train companies and buses to rethink their end-to-end service—and their interplay with other modes of transport. Fjord has identified 19 key round journey stages (such as Plan, Transport to Airport, Return Preparation, etc.) of which only two are ‘Fly’—the traditional core skill of an airline. Viewed systemically, new needs emerge, such as sharing your travel dreams, local transportation, getting currency, preparations like visas—even reflection on the experience. Winners will be those who capture and facilitate this experience chain.

**Mercedes-Benz’s diagnostics service, mbrace2, enables users to check on the performance or mechanical status of their car through a mobile app.**

Some have started. Copenhagen airport wanted to provide an enhanced passenger experience and improve efficiency of airline operations—Cisco added 900 access points throughout the airport in order to be able to track each passenger’s journey through the building. The belief is that people already know that they are giving up privacy and anonymity when entering an airport, so they are less likely to have any concerns.

From this, a ‘find your way’ app was created to help passengers find their gate in realtime and also direct them to potential points of interests. Copenhagen’s big point on this was to be able to prevent ‘choke/pain points’ so that passengers can spend more time dining and shopping. Copenhagen is on target for a 50% year-on-year increase in passengers since this went live.

The future would be to use the ‘find your way’ app to reduce passenger-caused delays. So if the flight is boarding but a passenger’s location is far away from that gate, the passenger can receive a notification essentially saying “hurry up.” London City Airport and others are developing similar systems.

Understanding the context of the user will be essential to timely delivery of the right information. For example, a critical and helpful distinction will be to understand if a traveler is on a routine or an exceptional journey. This shapes fundamental priorities: For example, we might expect a routine commuter to be interested in delays, friends, distraction and efficiency, and an exceptional traveler to have more needs around directions, places and sights, focus and discovery.

Business travelers are often a hybrid—regularly on the move but not always to the same places. Thales Group has unveiled its Immersive Business Class Seat, an airplane seat that can be controlled by an app and detect entertainment preferences using social data. Created in collaboration with B/E Aerospace and BMW Designworks, the system consists of a luxury, semi-private space which features an ultra HD display, surround sound and touchpad controls. Those booking the seats can download a companion app through which they can manually select the configuration of the space, entertainment and on-board services before they board the plane. Optionally, they can load their social media profiles to let the app detect the preferences they might like.

When a train arrives into a station, it’s often the case that travelers aren’t spread evenly along the platform and are huddled...
in the same spot. This is annoying for both commuters and operators, because it means that some carriages become full while others are left empty and leads to longer boarding times. In the Netherlands, the NS Reisplanner Xtra app has already offered train users a way to find a seat using their smartphone. Now the country’s Edenspiekermann design agency has developed for train operators ProRail and NS, a platform-length LED display which provides realtime information on carriage crowdedness and other details.

Fjord has identified 19 key round journey stages (such as Plan, Transport to Airport, Return Preparation, etc.) of which only two are ‘Fly’—the traditional core skill of an airline.

It consists of a 180-meter long color LED strip that spans the length of the platform. The display aims to give commuters all the information they need to know about where they should wait to get on the right carriage. Numbers show whether the carriage is first or standard class, and the exact position of the doors will be is also marked. Symbols show the carriages that are best for bikes, buggies, wheelchairs and large luggage, as well as quiet carriages. The boards also work with infrared sensors located on each train that detect how full each carriage is. A green strip means there are seats available, a yellow strip indicates that the carriage is fairly crowded and a red strip means it’s full.

Disney’s visitors are always by nature exceptional, not routine. Disney has invested $1 billion enriching the theme park experience through implementation of wearable technology like the MagicBands. The bands enabling park and guest room entry, cash-free payments, shortening of queues and a tailored experience, including meals ready to eat as soon as you sit down. The MagicBand is at the core of a global, market-leading hospitality Living Service. Hotels are also investing quickly and focusing on the mobile as the key device: Hilton and Starwood have introduced keyless guest room doors with a mobile app acting as the unlocking device.

What all of these have in common is the lack of a unifying end-to-end experience or platform—though Disney comes closest, as the theme park is so self-contained. As we see with other industries, the really disruptive Living Services opportunity in travel and hospitality will be with those who can close the gap between journey handoffs and bridge from home to destination and back again. Handoffs, of course, exist across industries too: Why should your in-flight entertainment finish at the gate if you have not completed the movie? Why not get a link mailed to you containing the rest of the film (assuming, of course, you have not been watching Netflix in offline mode)?

THAT’S ALL (PART OF THE SERVICE) FOLKS

In many ways, the media and entertainment industry has been affected more by the first two waves of digital innovation than any other: reshaped and reinvented through new platforms, user-generated content, alternative business models and cord-cutting. Partly because of this, Fjord expects the content industries to be less directly affected by Living Services than most others. Three key questions will be thrown up.

First, as media and content choice continue to proliferate (cars become a media hub, for
example), where is the Google or Spotify of broadcast content? The multiplication of channels, combined with rights issues, makes it so hard for users to find specific video content. This compares poorly with information, where users can turn to Google, or music, where they can find most music they wish on Spotify. Will the era of Living Services create an opportunity for a disruptive play that makes video content accessible wherever and whenever—even if at a price? If our theory on Atomization (see Chapter 5) is correct, the future of channels is questionable: Indeed, the average Net Promoter Score (NPS) for over-the-top (OTT) on-demand services in the U.S. is 39, much higher than that for traditional TV providers at 12. If music can create services with intuitive discovery and recommendation, such as Sonarflow, why can’t video?

Second, media is in the attention business. Living Services will play out in one of two significant directions. Either new calls on our time and immersive experiences will reduce the role that traditional linear content plays in our lives, or the new era will save us valuable time in discrete parcels as routine tasks become automated—leaving us with more time to relax or consume media. Right now, it is too early to say which.

“Don’t start with the technology, start with the audience.”

-Kim Shillinglaw, controller of BBC Two and BBC Four

However, we can predict that Living Services will affect content itself. As Kim Shillinglaw, controller of BBC Two and BBC Four (quoted in Wired) said: “Don’t start with the technology, start with the audience. How do they want to spend their time? I think viewers want three things. First, they want to relax, to escape and to feel part of something. This is what narrative-driven and event-led TV does. Those types of programme will only become more popular. Second, I want to watch what I like when I like—control is important. Third, although I want to be in control, I want it to be easy. Technology often asks us to work too hard. Recommendations need to be as good as a great curator. Netflix’s algorithm is very smart, but in the next decade new algorithms will start to recognise me and my interests, and aggregate from games that I play and websites that I read as much as from shows I’ve watched.”

TomTom, the in-car satellite navigation brand, has diversified its services to create Usage Based Insurance (UBI) systems.
New ideas are creeping into live entertainment: Lightwave is a piece of wearable tech (a wristband) that delivers live crowd engagement data to DJs, helping them tailor their set in real time. The bands measure data such as movement, audio levels and body temperature, and these data points are then fed through to the DJ, who can see at a glance how many people are dancing and how well those at the back can hear the music. Since DJs already often include events in their sets designed to get the crowd going — ‘dropping the bass,’ for example — Lightwave can give them data that can help them decide the best point to do it.

However, Living Services may well flow or be sold through media channels. So the third question is what role can entertainment companies play as a part of Living Services? The 2014 Ericsson ConsumerLab report tells us that Interactive TV and Click-to-Buy—order anything you see on TV using your remote—are among the two (out of 24) least important TV and video features. The findings are based on research from 23 markets including Brazil, China, Germany, Indonesia, U.K. and U.S. It is unclear as yet whether media can break into this lucrative new market.

ENSURING SERVICE INNOVATION

Insurance brands have long known that their products are considered grudge purchases, with huge inconveniences involved in the claims process and little added benefit. Users typically ‘get it and forget it,’ and only interact with the provider when something bad has happened. Living Services will offer huge benefits to the insurance industry by allowing insurers to build far more enhanced and ongoing relationships with their customers.

For an industry so dependent on a complex eco-system (brokers, underwriters, funds, agents and adjusters, among others), it is hard to see how disruption will create wholesale change. However, the fusion of data and interconnectivity that is fueling Living Services could completely transform our notion of what an insurer should do for us.

New ideas are creeping into live entertainment: Lightwave is a piece of wearable tech (a wristband) that delivers live crowd engagement data to DJs, helping them tailor their set in real time.

Insurance startups could shake up the market considerably here: Challengers may emerge that rethink the business model of insurance from top to bottom. Within healthcare, insurance companies will start to shift customer experience from being largely about acute medical events to detecting and helping to treat and prevent long-term chronic issues.

With this new ability to survey and track behavior across environments (and the devices that accompany them), the insurance industry has a huge opportunity to capitalize on the resulting data. Wearables and ‘Quantified Self’ innovations could translate fitness and wellness goals into insurance breaks and benefits.

Based on a study of U.S. consumers, research company ON World, predicts that by 2017, 515 million health sensors designed for wearables, to be implanted or used in mobile health and fitness devices, will be shipped globally—an increase from 107 million in 2012. It’s a short jump from collecting personal data to improve your
running performance to using that data to save money on health insurance.

In the automotive space, real opportunities will emerge that will link realtime data about driving performance to insurance premiums with telematics insurance.

**TomTom**, the in-car satellite navigation brand has diversified its services to create Usage-Based Insurance (UBI) systems that can be applied to either private drivers or fleet operators.

Its insurance telematics system enables insurers to give policyholders immediate feedback about their driving performance. Policyholders that share their driving performance data can prove they are low-risk, enabling insurers to make far more informed judgments about risk and potentially lower premiums.

Similar telematics or black box insurance services, whereby a device is fitted to a customer’s car to monitor how well they drive, thus enabling premiums to be calculated individually, are becoming more commonplace. U.K. insurance companies offering this service include AA with its AA DriveSafe service, Admiral LittleBox, Halfords’ Autosaint and Tesco Bank Box.

**BMW has partnered with insurance carrier Allianz U.K.** to build a custom product for its BMQi3 and i8 electric vehicles, and plans to market its own brand insurance to drivers of these cars. Its insurance service will be based on customer’s mileage tracked via an embedded in-car system integrated with BMW ConnectedDrive technology, which will generate information for monthly statements sent directly to the policyholder.

But the opportunity is not all about incentives to save. It is possible to envisage services such as safest route recommendations linked to insurance premiums; best parking options based on security, price or convenience; accommodation recommendations; and realtime traffic and navigation feeds.

**The fusion of data and interconnectivity that is fueling Living Services could completely transform our notion of what an insurer should do for us.**

Should a collision happen, we’ll see telematics offer immediate and automated help at the scene, and later, damage diagnostics with direct connectivity to a real or automated customer service adviser.

This is already in use with the OnStar FMV aftermarket product, a GPS-equipped rear-view mirror that can be fitted to your car and which will alert emergency services and direct them to the scene in the event of an accident.

**MAKING THE MOST OF MY MONEY**

Customers’ experience of financial services can be defined by their personal timeline: past, present and future. In insurance, rectifying the past with financial compensation has largely been the core of the business. As we have seen above, a major shift now underway is for insurance companies to contact customers during incidents to help them sort problems out in the present—from car accidents to burst water pipes. Living Services will shift insurance to a future focus, where insurers use data to predict risk.

Likewise, banks will increasingly offer customers a timeline where past, present and
future become an illuminating lens. Why is my balance like it is? What am I safe to spend now? What will my money look like in a year’s time? We will move from a ‘statement’-based mentality to an expectation of fluid snapshots of our wealth status.

Gradually this will change the shape of what banks have to offer. There are four major steps toward this.

**Living Services will shift insurance to a future focus, where insurers use data to predict risk.**

Expect to see the emergence first of all of self-checking statements: If receipts are increasingly digital, why should these not be routed to our banks for automatic checking against our spending history, which then alerts us to anomalies or transactions for which there appear to be no receipt? Simple thumbprint approval could also transform debit and credit card security routines. The BillGuard app alerts users to suspicious charges in realtime and allows them to keep in contact with merchants to resolve the issue wherever they are. Like an inbox for payments, users can swipe to confirm the payment or to mark it as a potential fraud. The app learns from user actions.

Second, using data analytics, why should a bank not predict your probable financial future based on algorithms developed by aggregating not only your past behavior but that of other customers too? If your bank knows you are likely to get into debt by the end of the month based on detectable patterns, would that not be a useful service? And more so if they could recommend preventative actions.

The use of data will allow banks to step into a role of helping us manage our finances more dynamically. Mint is heading in this direction already: It pulls together all your balances and transactions. This allows monitoring of spending; bill alerts; over-budget alerts; tracking of mortgage payments; and a fraud warning service. Tink is a personal finance app that consolidates and manages all of a consumer’s finances; once the initial financial information (i.e. banking/credit card) has been entered, Tink automatically retrieves new data once a change has occurred, allowing for up-to-date analysis, no matter how many bank accounts a consumer has, and features automatic categorization of spending. Pocketsmith looks at all incoming and outgoing transactions to create a long-distance forecast of predicted bank balance—even to a given date.

The fourth step is to create a platform for Living Services transactions. Probably this is also the most challenging—as many other players (notably Google, PayPal, Apple) are jockeying for this key role. The ambition will be to link your bank (think money plus data) directly to other areas of your life. These are likely to be those where the pace of change is rapid—that is, change either in data created or emergent needs you have. For example, if your bank account knows your power consumption, it could predict your future financial state more accurately. If your bank knows you are traveling, could it proactively negotiate better currency rates from ATM providers or foreign exchange dealers? Or seek and negotiate best petrol prices as you are driving—and prepay so you can drive away without physically handing over money. Israeli company 24me is already heading in this direction: Its app automatically syncs with utilities and other services to remind and enable users to pay their bills.
EXAMINING E-DUCATION
From today’s prescriptive cramming for standardized tests, to tomorrow’s individual pathways through a landscape of learning, Living Services will reshape the field of education forever. This sea change will mean teachers will be freed up from time-consuming classroom management to focusing on teaching that is targeted to each student’s personalized data, while students of all ages would benefit from a more tailored and individual approach that recognizes their unique needs and talents, giving them a better chance of fulfilling their potential.

Although there is enormous scope to design personalized, automated learning services in the field of education, in contrast to the health and wellness sector, education has seen relatively little innovation with impact—so far.

We will move from a ‘statement’-based mentality to an expectation of fluid snapshots of our wealth status.

One exception to this general trend is the area of managing classroom behavior. According to anecdotal evidence, teachers spend 50% of their time managing student behavior. A new feedback app called ClassDojo aims to address this problem by using behavior-tracking analytics and reports that allow teachers to address issues in realtime to students, parents and administrators. Crucially, the app reinforces good behavior by awarding feedback points and praise notifications and by reducing the time between a student’s action (positive and negative) and teacher feedback about that action.

Meanwhile, a new app called BeHere uses Apple iBeacon technology to keep teachers informed of students’ attendance at their class without the need to do a roll call or take the register. To work, the app has to be installed on both teachers’ and students’ devices. Once installed, it also allows students to tap a button to request help from their teachers ahead of the class, with requests for help being ‘queued up’ on the teacher’s device.

Arizona State University has come up with an early warning retention tool, which collects its students’ data and tracks them.
Arizona State University has come up with an early warning retention tool, which collects its students’ data and tracks them. Through student ID cards, the university can track students’ activities and know when they get to classes, visit the library and go for lunch. The university began using this data with predictive analytics to identify if freshman students were at risk of not passing or if their grades and performance were declining. It provided an early indicator that meant the students could receive advice on other academic courses or alternative majors, and best of all, this information was provided by the predictive analytics tool. Implementing this tool led to an 8% increased freshman retention rate.

Meanwhile, a new app called BeHere uses Apple iBeacon technology to keep teachers informed of students’ attendance at their class without the need to do a roll call or take the register.

As the ClassDojo and Arizona State University examples show, there are potentially huge benefits to be gained from designing Living Services tailored to individuals at both ends of the educational spectrum.

In junior education, personalization could revolve around different styles of learning that a child leans toward (visual, audio, tactile, numerical or how fast they can individually absorb information). Different packages could also monitor skills and developmental requirements across a broad range of criteria including psychological or emotional issues. The program delivered to a child with low self-esteem might differ from that offered to a child who is self-confident. Monitoring responses could help pick up issues such as dyslexia far earlier and automatically integrate helpful learning regimes.

Living Services could help integrate learning more effectively into lifestyles outside of school.
Further on in the educational cycle, Living Services could help integrate learning more effectively into lifestyles outside of school. They could, for example, understand what students are doing, where they’re spending time and what they need to focus on to improve their results.

Expect to see more ambient personalization, as well as contextual encouragement: using data such as geolocation, time or other levers and seeing when students are looking at studying or encouraging them to study at key points in the day. This will be because we know they’re at home, or have an hour before they are due to do something else. Similarly, Living Services in education could link wearable devices that track a student’s physiological state and change the educational input accordingly, so if a service detects that a student or class is tired, the educational input switches from text to video.

Educational Living Services that feature a data-driven approach, capable of understanding an individual student’s learning style and areas of weakness, will be the ones that succeed in this space.

Educational Living Services that feature a data-driven approach, capable of understanding an individual student’s learning style and areas of weakness, will be the ones that succeed in this space. Language learning/text translation platform Duolingo is an interesting example. The platform features a gamified approach to learning, with users able to gain skill points as they learn and display language skills, with points deducted for mistakes. At every level, the service assesses the users areas of weakness, enabling it to flag them up to the user.

Looking ahead, Living Services will also play a role in helping students choose what to do with their futures by assessing what they are doing and what they enjoy doing and then projecting which professions might suit them. Algorithms could indicate where they need to improve to achieve career goals, coordinated with requirements for individual employers.

Living Services could have a particularly beneficial impact on children with learning difficulties. Already researchers at Georgia Institute of Technology have teamed a humanoid robot with an tablet to help children with cognitive and motor-skill disabilities to teach a robot to play Angry Birds. The idea behind the initiative is that the robot-smart tablet system can act as a future rehabilitation tool for children faced with these learning disabilities.

Applying Living Services to the education sector is another major strategic, long-term challenge. However, just as with health and wellness, it is an area that should benefit from the huge efficiencies created. Teachers will be able to respond far more effectively to personalized data about students and overlay their own skilled assessment and input in a more targeted fashion. Educational managers will be able to see in micro-detail where resources and specific skills should be applied, and we’ll see the rise of learning agent roles to support this new system. Students, of course, should benefit from a more individualized and engaging learning experience that offers them greater choice about how they learn and, ultimately, which careers they pursue.
Further on in the educational cycle, Living Services could help integrate learning more effectively into lifestyles outside of school.

As the KnowledgeWorks Forecast 3.0 states: “learning will no longer be defined by time and place”—and this will fuel the introduction of live educational services that offer radical personalization, ongoing evaluation and feedback. Education will be continual and lifelong, not just restricted to the first two decades of your life.

HOME IS WHERE THE HUB IS
There are few areas of our lives set to benefit more from Living Services than our homes—currently the hub for thousands of dull, disconnected and time-consuming tasks. From efficient energy management, such as switching on light bulbs and heating to coincide with when we get home, to smart alarms that allow us to monitor security from anywhere in the world, Living Services are emerging that make our home lives smoother and easier to manage remotely. And with Living Services likely to influence our entire day, the home could emerge as the source from where our complex digital lives can be unified, helping us to manage an otherwise overwhelming number of devices and data sources from one, all-important hub.

Our primary personal spaces are already proving fertile ground for the emergence of Living Services. As appliances have become more advanced and Wi-Fi connectivity faster and widespread, the possibility of creating households populated by multiple connected devices is firmly underway.
The core ambition behind creating a connected home is simple; it’s about designing ways to make every aspect of home life easier to manage and smoother to run, leaving more time for useful or fun activity.

Broadband market intelligence company Point Topic predicts there will be 940 million broadband subscribers worldwide by the end of 2018, a dramatic increase from approximately 150 million in 2004. It expects the 1 billion-subscriber mark will be exceeded within this decade and forecasts the strongest growth will be seen in Asia and Eastern European regions during this period. Forward-thinking companies, be they from the appliance side, service industry side or startups, have started to extend their offerings to improve the lives of inhabitants. This is beginning to give people more information, more control, better remote access and improved overall management of their home environment.

For example Samsung, Intel and Dell have joined forces to create the Open Interconnect Consortium, which aims to establish a universal set of standards for smart home appliances, including thermostats and light bulbs.

In parallel, Qualcomm and Microsoft support the AllSeen Alliance project. Microsoft has also teamed up with American Family Insurance to create a home technology incubator in order to foster new connected home products.

Apple, meanwhile, is pursuing its HomeKit platform, which aims to integrate a range of apps that control home appliances and services.

Rather than calling this the ‘connected home,’ perhaps a better moniker in the near-term would be the ‘distributed home,’ as control of smarter home devices becomes possible via mobile access.

So although the fully connected home is some way off, what we will see on the journey toward this ambition is the gradual automation of segments of home life. The sheer number of entrants to the domestic energy management and security is noteworthy. For example, Chai Energy, a startup home technology business, has created an integrated energy management system enabling consumers to control heating remotely via smartphones and providing individualized home analysis that can advise them on how to save on energy bills.

Microsoft and Smartlabs’ Insteon have teamed up to market kits helping people to create DIY connected homes based around a central hub and capable of being controlled via Windows phones. The kits could allow users to control multiple homes or business locations remotely, enabling them to provide or limit access for individuals, monitor via cameras or control lighting and energy use.

Another startup example is Novi Security, a remote monitoring system based around a
smartphone app that lets users see what’s going on at home via HD cameras, and receive alerts if smoke or motion is detected via sensors.

Although the fully connected home is some way off, what we will see on the journey toward this ambition is the gradual automation of segments of home life.

Meanwhile, Wallflower is a fire-prevention system that constantly monitors the status of electricity and gas supplies to a home. Consumers can be alerted if a fire or other hazard occurs and are able to remotely shut down supplies via their smartphone. With growing concerns in many markets about the cost and certainty of energy supplies, coupled with governmental regulations enforcing the installation of smart meters (for example in the U.K.), it’s inevitable that energy management should be a priority for innovation.

So, for example, Nest, and ecobee, identified that consumers needed a thermostat that learns their preferred temperature and their schedule and automatically programs itself to suit its owner. It can be controlled from a mobile phone, instead of consumers constantly adjusting a dial on a wall.

Nest, now owned by Google, also understood that consumers wanted a smart smoke detector that keeps them safe without going off every time the toast burns and which can be silenced with the wave of a hand. Nest Labs linked up with Big Ass Fans to develop smart ceiling fan SenseME, which learns owners’ preferences and adapts accordingly.

Google has wasted no time in spinning partnerships out of its Nest Labs investment with other lifestyle or home product brands, including Mercedes, Jawbone, LIFX and Whirlpool, allowing its Nest smart thermostats and smoke alarms to be triggered by third-party devices and products. Google’s Nest Developer Program is intended to open its technology beyond existing control protocols via smartphones to third-party-owned devices.

LIFX’s smart light bulbs will be programmable, so, for example, they could be primed to come on at night when householders are away. Jawbone wristbands could use motion-sensing technology to detect when the wearer wakes and turn the lighting or heating on. Mercedes cars could tell the home management system when they are due for a service, or prompt it to turn on the heating when the vehicle and its occupants are 30 minutes from home. So far, many of the companies exploring this area are doing so via solutions for single problems such as August’s keyless locking system. Philips has developed a wireless lighting system that uses smart technology to create a home lighting scheme that can be individually controlled to change color, mimic natural sunrise, alert you or welcome you home.

Devising connected products for the home has proved appealing to interior and home product designers, with the result that there are a growing number of specific (and sometimes bizarre) items with connectivity functionality added. These include an egg tray that tells you when your fresh eggs are reaching the end of their life; a vibrating fork that helps users to eat more slowly and
therefore avoid overeating; and a smart air conditioning unit that uses GPS data to turn itself on and off based on when people leave and arrive.

The next stage is for all (or at least the most meaningful) of these disparate elements to connect and communicate with each other, so the individual is not given the onerous task of monitoring and controlling multiple elements within the home.

Neura is a startup aiming to create individualized personal networks of connected devices and objects. Its core technology is designed to connect a web of disparate smart objects and enable them to recognize people’s habits and behavioral patterns through behavioral data.

Samsung is another good example of a brand starting with a specific approach to optimizing products with smart technology, then seeking to expand its service capabilities.

The Samsung Wi-Fi-enabled smart fridge, complete with a screen, allows owners to browse the Web, access apps and connect to other Samsung smart devices. However, Samsung clearly has ambitions to integrate its products into a networked service. The company recently acquired South Korean-based Smart Things, which builds home-automation kits.

SmartThings is an app and Hub that connects different sensors and devices in the home so they communicate with each other and provide the customer with a connected home and more joined-up home security. The Hub and sensors look at your home’s vital statistics such as motion, human and animal presence, vibration, temperature, and doors and windows opening and closing.

As this shows, smaller startups or fleet-of-foot technology companies have often set the tone in terms of development, with bigger, established businesses in vertical home-service sectors subsequently taking a keen interest.

Elsewhere, Apple has a patent for a comprehensive home system that helps manage devices with an impressive sounding feature that anticipates a person’s needs

LIFX’s smart light bulbs will be programmable, so for example, they could be primed to come on at night when householders are away.
without any user input. Meanwhile, AT&T is jumping in with Digital Life, a package that means people can remotely manage their home through cameras and mobile door control. It also offers energy management and leak detection. With water damage being responsible for 70% of U.S. domestic insurance claims, even small improvements in this space could have widespread economic impact.

Using motion sensors and predictive analytics, the sensors detect how fast cars, bicycles and pedestrians are traveling and supply light as required, rather than simply reacting to stimuli.

The ability to shape and control one’s personal space, environment and dwelling is a powerful driver in terms of the potential demand for Living Services. But the concept of the distributed home also has an interesting echo in social media by expanding into connected neighborhoods.

Imagine if networks such as Nextdoor or Neighborland linked with devices and Living Services in people’s homes. Energy-conscious communities could rethink their energy-expending behavior together, for example.

One business already innovating in this field is F-Secure Lokki of Finland. It has positioned itself as the provider of smart remote security but now boasts a wider role, bringing family, friends and places together through one central screen while you’re on the go.

If home-based Living Services begin by solving specific problems, making little parts of household management easier or better, they will gradually transcend many different service categories and aspects of our lives. Over the next 20 years, the home may develop as a hub of Living Services that reaches into social communications, community relations, purchasing, travel, childcare and work.

LIVING CITIES
Having examined how Living Services will transform specific areas of our lives, at a macro scale, cities are where we can expect the impact of Living Services to be writ large. Cities are where we (usually) live, work and play. The evidence suggests that smart solutions are urgently required to address the challenge of fast-growing city populations. Already, more than half the planet’s population lives in cities, with some forecasts suggesting that by 2050, 70% of the world’s 9 billion people will live in urban areas.

How will we supply adequate facilities for booming urban populations, such as street lighting and refuse collection? Then there’s the need for smarter ways of easing congestion, helping people and vehicles move around the city faster and more easily, and managing unhealthy pollution levels.

We see three main ways Living Services will help meet these challenges for cities:

1. Connected mobility
The dynamics of the Internet are already enabling innovative services that help city’s workers, tourists and residents to move around much more easily without having to build new infrastructure, such as ring roads, bypasses and parking lots. The growth of smart apps such as Citymapper and parking apps such as Streetline help people to
move around a city quickly and easily, by providing realtime information about the nearest available parking spots and which roads or tube routes to avoid. Looking ahead, it’s possible to imagine a much more joined-up approach to improving city mobility. An app could direct a driver stuck in city-center traffic to the nearest available parking space, and then help them to reach their destination by highlighting the nearest available bike-sharing bay where a bike is ready for them to use.

2. Smart buildings and streets
Environmentally unsound buildings collectively have an enormous impact on air quality in cities. So the benefit of using sensors that can collect realtime data about a particular building’s energy efficiency or carbon emissions is clear.

This information can be scaled from an individual building to a street, to a whole district, giving town planners, utilities companies, health workers and environmental professionals a detailed picture of problem hot spots. Sensors embedded in buildings, air-conditioning units, water pipes, lighting, heating and security systems will deliver equally valuable data to the landlords of individual buildings. This can be used to develop Living Services that anticipate when crucial repairs will be needed, and to help keep occupants comfortable and utilities bills low by adjusting settings to meet realtime changes in occupancy, temperature and time of day.

Pioneering companies are already developing smart technologies that make the urban environment a more pleasant, energy-efficient place to live and work. Finnish startup Enevo has pioneered what it describes as waste collection for smart cities by installing wireless sensors in waste containers to measure and forecast their
fill-levels, emptying them only when they are full, while at the same time as generating smart collection plans using the most efficient schedules and routes. Using this smart technology-driven approach, Enevo claims to provide up to 50% in direct cost savings in waste logistics.

Meanwhile, Europe spends more than €10 billion on street lighting, which results in more than 40 billion tonnes of carbon dioxide emissions. This represents a considerable waste of resources when the streets in question are empty. To address this, lighting solution provider Tvilight has designed a system for cities that tracks vehicles and pedestrians, lighting up the nearest street lamp as they approach. Using motion sensors and predictive analytics, the sensors detect how fast cars, bicycles and pedestrians are traveling and supply light as required, rather than simply reacting to stimuli. While Tvilight’s sole function is responsive lighting, there has been speculation about other uses for the technology, such as traffic lights turning red if an ambulance is approaching.

3. Reimagining retail space
We can expect Living Services to help bricks-and-mortar retailers claw back some of the ground lost to online retailers, or at the very least provide a much more integrated approach to managing customer journeys across a retail brand’s physical and virtual touch points.

The concept of positioning sensors at stores’ entrances to identify consumers and deliver offers to their mobile devices tailored to their purchasing history and profile is nothing new. Bluetooth technology was conceived with this kind of functionality in mind. However, this concept is being honed and expanded by Apple’s iBeacon project.

Retail is fertile ground for the synthesis of data with contextual relevance and new interaction paradigms.

With its announcement of a patent for anticipatory shipping, Amazon has heralded the imminent arrival of Living Services in shopping. Retail is fertile ground for the synthesis of data with contextual relevance and new interaction paradigms. Much of the speculation has centered on new ways to sell and promote: The industry standard scenario usually includes a shopper being bombarded with ‘offers’ on arrival at a location. The mistake is to confuse advertising with service, and to imagine that on mobile devices, unrequested ‘offers’ are desirable, manageable or even scale well in a multiple outlet shopping mall. Meaningful service on the other hand, increases engagement and raises the chance of commercial success by pleasing the customer.

By working with Pinterest, Nordstrom is showing the way. We all leave behind us a trail of digital footprints whatever we do: Pinterest is a particularly rich trail of taste and visuals. Nordstrom uses it to help determine store merchandising on a weekly basis, as well as providing staff with an iPad app, which makes it easy for them to show customers trending products and merchandise live. Expect window and in-store displays that respond (with your permission) to your approach by offering products that match to your known tastes. Adidas has already experimented with interactive window displays. This gets around the issue of seeking screen time on a consumer’s portable device: The idea that we have apps for every shop we enter is not scalable, and much of the time we wish to have our heads up to look at
merchandise. Burberry’s flagship store uses RFID technology woven into its products to trigger multimedia content relevant to each item on in-store display screens, personalizing the shopping experience.

The challenge to retail, of course, is that shopping can happen elsewhere. Living Services will accelerate this trend.

Amazon Dash is a Wi-Fi-enabled device that combines barcode scanning and voice recognition to allow householders to assemble shopping lists on the fly—and then proceed to purchase. Hiku is a similar technology. In the near future, this kind of approach—augmented reality app Blippar is another good example—will create a world where everything becomes a shop. Consumers will literally buy what they see (assuming they can afford it, of course) at the point of desire—which could be anywhere.

On a macro scale, data from sensors tracking the movement of cars and pedestrians within key areas of a city could be correlated with footfall and purchase data from individual stores. This data will be interpreted by powerful analytics software, providing store managers with realtime insight into likely busy periods, enabling them to offer well-timed promotions designed to appeal to the widest possible number of consumers.

The idea that we have apps for every shop we enter is not scalable.

These data sets will also be useful for town planners, architects and designers, providing information for analysis and improvement of city centers so they evolve in line with the changing needs of local communities. In practice, this could mean Living Services enable the way in which rates and parking restrictions change in realtime, adapting to what people need to do.

All of this is critical to cities: If retail cannot compete with online, eventually an abundance of retail real estate will affect city centers.

We all leave behind us a trail of digital footprints whatever we do: Pinterest is a particularly rich trail of taste and visuals.
and suburbs alike. If, on the other hand, retail space plays a leading experiential role in the purchase cycle, that too has city-side implications on traffic, opening hours and the movement of goods.

**WELCOME TO THE INTUITIVE WORKPLACE**

The next major connected ecosystem to emerge beyond our cars and homes is likely to be the workplace, where the benefits of Living Services for workers at all levels will be palpable. Enhanced digital devices and services will allow us to manage our workloads in the office more effectively. Wearables that monitor our levels of alertness and well-being will help us boost productivity by allowing us to schedule harder tasks for times of the day when we are at our peak, helping to make the daily grind a more enjoyable and less stressful experience.

The sophisticated data generated through Living Services will allow senior management to develop a greater understanding of the needs of employees, and better data will mean better decisions. The benefits of Living Services will also stretch to heavy industry. Smart sensors will allow workers to communicate with complex machinery in realtime, allowing operations to run smoothly and in turn drive efficiencies.

These days, a workplace without desktop and mobile computing is ... unimaginable. In five years’ time it is probable we will say the same thing about work-orientated Living Services.

The amount of time wasted in pointless management meetings; waiting for the right equipment to arrive; the delayed arrival of information, people or supplies is something we have all experienced, but has probably never been fully quantified.

Desktop computers, mobile phones and tablets have, of course, created work efficiencies, but intuitive Living Services designed to work from the point of view of individual workers could help boost performance by offering a form of quantified self for productivity. Imagine a scenario where workplace-sponsored wearables would be able to track an employee’s heart rate, posture or blood sugar and could provide an early warning that he needs to take a break.

**Wearables that monitor our levels of alertness and wellbeing will help us boost productivity.**

If this sounds far-fetched, London-based predictive analytics firm The Outside View requires all its staff to take part in an experiment that involves them using a variety of apps and wearables such as Sleep Cycle, Moves and Meal Snap to track how much they eat, sleep and how happy and fit they are, in a bid to develop a more productive workforce. While the move arguably raises legal and ethical issues, the company has said it believes employees are happy to wear the devices and it will address any legal issues as they arise.

Elsewhere, Living Services could speed up the pace of many different spheres of enterprise or public service delivery by providing very specific data about a work scenario or piece of hardware. This could be very simplistic, such as warning a management team due to travel to a regional office that a flight has been delayed and automatically providing alternative options. Or for example, it could be very complicated, such as designing a Living Service for an airline fleet maintenance schedule coordinated with aircraft component monitoring and spare part sourcing.
The next major connected ecosystem to emerge beyond our cars and homes is likely to be the workplace, where the benefits of Living Services for workers at all levels will be palpable.

Distinctive specialist equipment is also becoming interlinked and connected to mobile and cloud computing facilities. For example, PocketScan allows users to scan any surface and render text or visual data straight to a screen-based device (scanned text and tables can be opened and edited in Microsoft Office and printed text can be translated). Ca7ch Lightbox is a wearable camera that can sync with mobile phones and send pictures and video automatically to the cloud.

Businesses are already generating huge volumes of customer and performance data. But imagine thousands of devices such as Ca7ch Lightbox, or position sensors in an online retail warehouse, working in unison to feed live data into business management or operational systems.

Technology that can manage realtime data on a massive scale is already emerging. For example, Amazon’s Kinesis is a system that channels and manages live data feeds so companies can use realtime data in their products and services more effectively.

While these examples are not yet true Living Services, they are beginning to create an infrastructure of connectivity, through which diverse workplace Living Services could flow.

Significant steps towards building business Living Services are being made in the area of field service management, for example, with delivery and in the field sales.

Workers out on the road and the equipment and vehicles they use are increasingly being linked in realtime back to headquarters, enabling sales managers, logistics teams and human resources departments to make more informed decisions rapidly.
For example, telematics units installed in delivery vehicles can transmit field information such as signature capture and GPS data to prove a delivery was made to a specific location at a particular time by a designated driver.

Living Services could speed up the pace of many different spheres of enterprise or public service delivery by providing very specific data about a work scenario or piece of hardware.

TomTom Telematics provides an integrated field service that combines satellite navigation and mobile business applications on a single device that can be used for a variety of tasks, from proof of delivery to monitoring the progress of individual workers or submitting vehicle safety checks.

HEAVY LIFTING MADE LIGHTER
Living Services will also have a major impact in the heavy-lifting industry, enabling far greater efficiencies. Take the energy industry, where there is huge potential to optimize the logistics around drilling for fossil fuels, including assessing geological conditions, predicting weather patterns and assessing and anticipating when equipment needs to be renewed.

Drilling crews may currently know the approximate lifespan of drill bits, for example, based on the manufacturer’s advice and drilling conditions.

However, energy companies’ information about the drill’s life cycle is based on averages, because the equipment is made using mass production. Using this information about the drill’s average life cycle, the energy company will replace drill bits after a set period and will do the same for all operations across the world.

By integrating smart sensors into machinery, the energy company will be able to create significant efficiencies by knowing in detail how each piece of equipment is functioning and when it will wear out.

The shift away from performance assessments based on averages to individualized information delivered to teams automatically when it is relevant has enormous implications for business operations. In fact, many people are terming the emergence of connected, contextually aware digital services into the industrial sector as the Industrial Internet of Things.

In the mining sector, connected infrastructure including Wi-Fi at the pithead, equipment with performance sensors and autonomous drone vehicles are becoming commonplace.

BHP Billiton is testing sensors in the buckets of the excavators that can grade the ore they contain, providing site managers with immediate information about the quality of the ore and how it should be processed.

Another example of an industrial Living Service is the Accenture Life Safety Solution for oil refinery workers. The service tracks each worker, monitoring poisonous gases, communicating with a central tracking system, enabling people to move around the refinery to perform routine maintenance tasks safely, while eliminating time-consuming paperwork and processes. At its core, it is a service designed to keep
employees who work in a potentially very hazardous environment safe. However, by automating health and safety processes, it has also become a productivity tool.

Accenture joined forces with AeroScout, Cisco and Industrial Scientific to develop the solution, which is a wireless gas detector combined with location-based technologies. The gas detector transmits information to a central location on the plant so it can alert the control room if gas levels go outside normal ranges as well as showing where an operator is located. It can monitor four gases: hydrogen sulphide, carbon monoxide, sulphur dioxide and nitrogen dioxide.

From drill bits to aircraft, rail, automotive, utilities and food production, the list of industries where individualized information could make an impact is endless.

**THE ALL-SEEING MANAGER**

In the domain of corporate management, the possibilities are infinite. Everything from app-based timesheets and expenses to workforce management and on-site engineering could become integrated, using external contextual information to coordinate the work of individual staff and optimize their performance.

It’s possible (though some will object not desirable) that data about the performance of individuals could be monitored throughout their career. This information could be integrated with psychometric testing, the results of physical or mental ability tests and details of training completed to create individualized work and career development plans. These could be coordinated with the various evolving requirements of a large organization. Staff with specific skills and experience could be transferred rapidly when required by a particular project. Meanwhile, their existing work could be prioritized and reallocated to fit the company’s realtime needs.

For organizations that interface directly with consumers and whose products are heavily dependent on national engineering networks or in-home hardware, there is huge potential to integrate workflow management systems with customer service communications. Living Services could eventually help to diffuse one of the biggest

Accenture Life Solution for oil refinery workers tracks each worker, monitoring poisonous gases and communicating with a central tracking system.
causes of friction between business and consumer: information about problems.

**From drill bits to aircraft, rail, automotive, utilities and food production, the list of industries where individualized information could make an impact is endless.**

However, Living Services will present significant challenges to anyone tasked with planning the future evolution of corporate operating structures. Most significantly, business and public sector organizations will be challenged to break down vertical business silos to create new ways to manage customers, suppliers and logistics continually across all touch points.
NEW INTERMEDIARIES: YOUR PERSONAL IT TEAM

As our homes and lives become increasingly connected and automated to form a personalized ecosystem of Living Services, opportunities will emerge for companies and individuals offering digital ‘backroom’ services or IT support similar to those that already exist in businesses, but tailored to a personal or domestic setting.

One potential gap in the market is how we manage transitions such as moving to a different house, town or country in a more connected digital age. Currently these life-shifts have primarily non-digital implications (such as the need to move furniture or to disconnect and reconnect utilities).

The complexity of relocating a personal or domestic Living Services ecosystem will provide an outsourcing opportunity for companies or individuals offering personalized digital relocation services capable of handling the complexity of setting up or dismantling a home or business Living Service or connected ecosystem.
05
PREPARE TO ATOMISE
Just as Google Maps and PayPal are embedded within a plethora of different digital services—while still retaining their brand identity—the Living Services of tomorrow will appear in a wide range of places and contexts.

Depending on where and how they appear, some Living Services will be clearly branded, others less so. Those Living Services that are prepared to allow elements of what they offer to be super-distributed by other services, or which allow other services to connect into what they offer, are most likely to survive and thrive within the digital service landscape that we all live in. We call this process atomization.

As the Google Maps and PayPal examples demonstrate, atomization is already here, encompassing a world full of digital plugs and sockets, where businesses can plug into each other, exchange information and services and combine them with their own products or services.

Brands can, for example, take one element of a third-party service and mix it together with parts of their own offering that consumers might like to use together. Or conversely, they can make parts of their own service flow freely to other companies or organizations. These can then be mashed together in an altogether different context.

Atomization is also prevalent among the new generation of music services such as Deezer, which enables users to integrate their account with Facebook and Twitter. They can then share favorite music and playlists with friends.

Online audio distribution platform SoundCloud allows users to upload, record, promote and share original music that they have created and tag it with a distinct SoundCloud URL. The service enables music files to be embedded anywhere so that they can be freely accessed via Facebook or other social media.

SoundCloud also distributes music using widgets and apps so that users can integrate SoundCloud into their own websites, and allows other applications or smartphones to upload or download music and sound files.
Disruptive services may have penetrated the music industry more than most areas of business, but atomization is also becoming apparent in industries such as financial services. Initially, this is happening in the guise of payment processing and social banking services, where a growing number of banks are integrating their functions with retailers or social media channels.

A good example of this is Turkish bank Garanti’s digital banking initiative iGaranti, which aims to atomize its banking services into a series of wallets, savings, loans and offers apps. Social integration across Facebook, Twitter and FourSquare allows iGaranti customers to send secure payments to friends via Facebook, tweet their friends with relevant offers and take advantage of location-based shopping offers while out and about.

Meanwhile, as mentioned before, PayPal, owned by eBay, is a prime example of an atomized payment-processing brand.

This is a world where the rules of branding and conventional business structures are fundamentally challenged and disrupted.

Operating in 200-plus markets, with more than 148 million active, registered accounts, PayPal has been plugged into a multiplicity of retail sites or single independent vendors, as well as providing users with a mobile app.

Of course, established credit card brands such as American Express, MasterCard and Visa were the first to blaze the atomization trail by linking their brands to retail bank transactions as well as retailers. These and others, such as Google and Square, are now normalizing mobile payment services.

Mobile banking is a major focus for banks worldwide. A number of global banks have launched mobile applications facilitating access to a range of services for consumers on the move. Customers are able to send money by entering the amount and mobile number of the recipient, like a simple text message. The app also enables retailers to use the system, initiating the process of atomization of the bank’s brand.

iGaranti aims to atomize its banking services into a series of wallets, savings, loans and offers apps.
There is nothing new in banks introducing apps, but what is interesting to watch in this space is how banks atomize. The process will be extended as more banks join peer-to-peer instant money transfer networks such as US-based clearXchange.

These innovations point to a world where banks and other brands have flexed their services to meet consumers’ increasing liquid expectations. Consumers could be able to order tonight’s dinner from their preferred supermarket, check utility service agreements and council tax information altogether at the same time, when using their primary banking app.

This is a world where the rules of branding and conventional business structures are fundamentally challenged and disrupted; where services appear intuitively to offer themselves to consumers according to the time, place or situation they find themselves in.

Atomization is a challenging concept as it implies a loss of control over brand experience and fits uncomfortably in most organization structures. That said, it is one that is not only beginning to manifest itself, but will increasingly take hold over the coming decade as the range of available Living Services expands and their availability and the way we can access and manipulate them increases in sophistication.

It is an aspect of Living Services that will arrive gradually but dramatically change the way businesses think and operate in the long term.

**THE ROAD TO ATOMIZATION**

Atomization of services is being driven both by consumer demand and matched by the ability of technology to deliver connected services on demand in the correct context. Ultimately, the delivery of atomized services will be governed by behavioral heuristics; in other words, a particular service should only appear in the right context when it will save time and help solve a problem. But before we examine this further, it’s worth exploring the impetus behind atomization in more detail. We are already surrounded by devices that continually create data based on what they observe around them. Although they are not yet capable of analyzing and reacting autonomously to this information, they can usefully collect, store, transmit and display data as it is needed. They are also connected to cloud-computing services from which they can get information as required.

**Atomization is a challenging concept as it implies a loss of control over brand experience and fits uncomfortably in most organization structures.**

As these devices have increased in sophistication and numbers, they have begun to change the way we think about and connect with the Internet. This can be most obviously illustrated by the arrival of apps on smartphones. Apps have conceptually moved us on from a world where our experience of the Internet was driven almost exclusively by web pages accessed by a browser. Apps are simply a different way to access connected content on mobile and tablet devices.

If we continue on this trajectory and begin consistently to weave in many other connected devices such as cars, thermostats, doors, lights, refrigerators and TVs, we will reach a tipping point where (surrounded by
web-connected objects) access to the Web is almost ubiquitous. At this point, what matters is not the means of delivery, but the service and its relevance to what we are doing at a specific moment.

This is a pivotal idea that will ultimately lead to a world where the blending of branded services in a stream is the norm, not the exception.

Services will flow in and around our lives, and we will not want to be limited to experiencing or accessing services that we make a choice to ‘open.’ In a world like this, apps that an individual must consciously and physically access by swiping a phone will feel archaic.

A WORLD OF BRAND PLUGS AND SOCKETS
The second key ingredient that is fueling the journey towards atomization is the desire to share or provide access to the mechanics of a particular piece of software that drives a service. From a technology perspective, this can be done in two ways: Companies prepared to share aspects of their services with third-party developers for the benefit of consumers can create a Service Provider Interface (SPI) which is an Application Provider Interface (API) that has been created specifically to be used or developed by a third party. Alternatively, companies can develop Software Development Kits (SDKs) that allow a third party to create spinoff services that connect with a masterpiece of software.

This openness is a mindset pioneered largely by technology companies. Facebook, Google and Twitter are among the leading proponents of this movement towards shared or open-source services. These brands have shared aspects of their services that are now connected or integrated into thousands of other digital services and brand experiences. Google Maps and Twitter feeds are classic examples.

To these and thousands of other innovative companies, the idea of enabling other businesses or organizations to take a part of what they offer, whether that’s a map or opinion-sharing facility, is a natural decision rather than an alien one. They understand that from the consumer’s point of view, the whole branded service experience is often not what is needed or desired at a given moment. Often, people will only want one specific part of a suite of service options.

Consumers are also increasingly transient in their usage of content and information, and as we have pointed out in Chapter 1, their expectations are liquid. Millennial consumers are inclined to snack on services and content and move rapidly between options. At the same time, they will increasingly favor contextually relevant services presented to them.

Businesses will need to be prepared to see their services become available in environments into which they have never historically ventured.

Working with this kind of audience requires brands to add value at every touch point. This can be easier to achieve by mashing up services when appropriate. The service you
Zillow, a US-based online real estate company created a mobile app preapproval service, enabling house buyers to secure a mortgage on the spot.

receive from, say, a retailer that has integrated a Swarm (part of Foursquare) plug-in is not just about the core retail experience being offered by that brand. For the consumer, it is also about the ability to share experiences and information connected with that brand via Swarm. The combination of the two disparate elements enhances the overall experience. Imagine the same thinking applied to travel, financial services, utilities or education, to name but a few. This is a pivotal idea that will ultimately lead to a world where the blending of branded services in a stream is the norm, not the exception.

LETTING GO—THE CHALLENGE FOR BRANDS

Atomization may be an inexorable trend, but it is also a very challenging one for big organizations and brands used to having complete control over their image and their relationship with customers.

It has profound implications for brand marketing, customer relationship management and the operational organization of businesses. While wholesale atomization of services is not an immediate prospect, it is one that anyone involved in long-term business planning must begin to grasp.

It will require brand managers to cede control of, or at least some access to, customer data, the display of that brand information and the absolute control of the brand’s image. Businesses will need to be prepared to see their services become available in environments into which they have never historically ventured.

Organizations will abandon the belief that at every given moment they must own the customer and micromanage his or her relationship with the service and brand, a change that in effect overturns 100 years of marketing orthodoxy.
In this future scenario, it becomes less feasible for a bank or telecoms company to be structured as a series of departments that deliver the customer components of a service and less possible to operate an organization geared always to cross and up-sell from one point of access.

This is a change that impacts brand strategy at the highest level, forcing brands to use data to ruthlessly identify the moments in which they belong in people’s lives.

Ironically, the very act of ceding control creates enormous opportunities both in terms of marketing reach and to stimulate a flow of new, hyper-relevant consumer service experiences.

**Spotify has become a pioneering example of an atomized service, achieving ubiquity by enabling access through multiple third-party touch points.**

Zillow, a US-based online real estate company, has extended its mortgage comparison services to create a mobile app preapproval service, enabling house buyers to secure a mortgage on the spot, as they view the house of their dreams.

The service requires users to secure approval in advance from selected mortgage providers. Interaction with these mortgage brands can then be managed in real time when it really matters.

It’s not difficult, for example, to imagine how a bank could atomize its mortgage services into a series of components that are relevant to people at different points in the process of buying a house.

**DIGITAL TREATIES AND ALLIANCES**

Because atomization works in two directions (organizations can plug their service into third parties or open themselves up to integration), it’s possible to imagine the evolution of atomization happening at different speeds and in different ways for brands.

A first step for many organizations may be to seek specifically targeted opportunities to build their offering into other services. As discussed before, digital banking initiative iGaranti is a good example of a brand that has created the socket for other brands to plug into. For example, Turkish retailers can access iGaranti APIs, enabling them to become part of the iGaranti service universe.

Retailers connecting with iGaranti are atomizing a part of their shop and plugging it into the bank. In this respect, they are ceding control of their brands’ route to the consumer over to the bank.

The second step, creating the socket and ceding control, may appear more challenging, but it is a business strategy that well-known brands such as PayPal and Square have already adopted to achieve huge reach for their services.

In the entertainment space, Spotify has become a pioneering example of an atomized service, achieving ubiquity by enabling access through multiple third-party touch points (e.g. Sonos, Ford, iOS, Android and Samsung Smart TVs).

The third step is to mitigate the perceived or actual loss of control over a service by setting brand behaviors so the brand
experience is delivered consistently in different circumstances.

In effect, this means the brand would have the same digital body language and interactions will feel the same and follow the same flow, thus reassuring consumers they are receiving the service through a completely unrelated object.

Consistent design language for brand services, in whatever alien environment they might appear, will become one of the primary areas of digital product design and in itself is an evolving challenge.

**Of course, a major (and growing) challenge that will need to be addressed by service providers and consumers alike will be the degree to which people are happy to share their personal behavioral data.**

**INTUITIVE SERVICE DELIVERY**

Ultimately, atomization of services could reach a stage where specific elements of a brand proposition are blended with other brands, based on behavioral and contextual data analysis linked to an individual. The vision is that services would automatically be presented to a consumer when that analysis concludes that the user would benefit from them.

But this will depend on the speed at which we can develop automated contextual understanding and the automated tailoring of a particular service to meet it. The technology will need to know when it is appropriate to offer a service and when not. Generic contextual understanding of consumer needs will be overlaid with personal preference and habit data, designed to deliver a tailor-made experience for each consumer.

There is a compelling logic to automation; there is only so much that brands can ask customers to do about setting or choosing preferences for service delivery.

Very few consumers will wish to spend hours choosing and configuring the 10 or so different services they want to flow through their new car, for example. They’d like the service just to know.

Of course, a major (and growing) challenge that will need to be addressed by service providers and consumers alike will be the degree to which people are happy to share their personal behavioral data. The way in which online advertising using behavioral targeting technology appears to follow consumers around has unsettled many opinion-formers and some consumers and raised questions about the need for personal information to be held by advertisers.

Brands seeking to automate service delivery and personalize the way in which services engage with people will need to tackle this head on. It is somewhat a chicken and egg situation: the new services themselves will help convince consumers that responsible companies should use their data, but unless that data is made available for use, the compelling services that convince them will not emerge. Privacy concerns are probably the biggest challenge to the pace at which this new digital era will take off.
06
DESIGNING FOR ONE:
SERVICES MADE TO MEASURE
Living Services will require organizations and businesses to transform their ability to tailor service experiences to the expectations and habits of individual users.

Making the best of this evolving opportunity to create tailored service experiences will require a new design philosophy; one that is rooted in behavioral and contextual data optimization. In other words, it will require a paradigm shift from designing one experience for many, to designing many experiences for one, with constantly changing needs.

Every category of product or service design, from cars to furniture, has, to date, been dominated by a one-size-fits-all approach. Design thinking in the digital space has, as yet, only challenged this regimented approach to product experience in limited ways. For example, with platform-specific designs for the different contexts of mobile, tablet or desktop, or by offering a limited range of fixed interactive options, or drawing on known customer purchase patterns (think Amazon’s recommendations).

Digital service design has, for the most part, historically created static experiences that do not change to fit user preferences or changing circumstances.

Likewise, service providers have typically offered a range of fixed service options that stay the same whatever device or context consumers use them in. These services remain static for the duration of their lifetime, until they are deemed redundant and replaced or updated.

What happens next will fundamentally challenge this approach. If a service is to ‘live’ in tune with our connected and demanding lives, it must learn and change continually so that it can match our needs seamlessly. Services will be assembled around the needs of the user in realtime; flowing through people’s lives and touching them in different ways at different points.

Not only must the core service and usability experience evolve, but it must look outside itself, change and connect with other services as appropriate. But first it must be designed to do so.
HOW DATA WILL FUEL LIVING SERVICES

Data is, in effect, the lifeblood of Living Services. As Luciano Floridi, professor of philosophy and ethics of information at the University of Oxford and author of “The 4th Revolution,” puts in his book, “when talking about ICTs (information communication technologies) it is easy to forget that computers do not compute and telephones do not phone, to put it slightly paradoxically. What computers, Smartphones, tablets, and all the other incarnations of ICTs do is to handle data.”

In order to create a living, breathing experience that can be continually tuned and tweaked to benefit the consumer, data must be collected, analyzed and acted on from two source points: the customers and the contextual environment they find themselves in as they use the service over time.

If a service is to ‘live’ in tune with our connected and demanding lives, it must learn and change continually so that it can match our needs seamlessly.

There are two structural pillars on which dynamic services will be designed.

1. Designing with data in mind

Rather than a tunnel-vision approach to designing a service with a fixed range of options and functionality, Living Services require an evolutionary capability to be designed in from the beginning. Designs must be immersed in behavioral data from the concept stage.

To achieve this, services must be thought through with the entire customer journey in mind: Every conceivable channel, touch point, start and end point, usage context, parallel or complementary service option must be considered.

A challenging but critical aspect of this approach is establishing the capability to capture granular behavioral and customer preference data, which entails the liberation of customer data from individual silos within an organization.

In addition to tracked behavioral data based on past interactions with services, designers must consider a framework of external data sources that can create a launchpad for a dynamic service. Take search engine history; product preferences and price comparison behavior; travel patterns and key locations; interests and social media use; demographic and personal attributes, for example.

The objective is to deliver an experience that feels to the consumer as if it has correctly anticipated their intent.

The ability to analyze behavioral data, continually add to profile data sets and then map these against appropriate content in real time is the core capability behind the delivery of what feels like a natural conversation between a brand and customer.

This also means that the component parts of the content and creative executions that make up the service must be broken down into ultra-granular components that can be constructed rapidly into many different, suitably tailored customer responses. High-speed analysis of metadata can then in effect act as the engine behind the
service that replicates a human-to-human conversational experience. This changes the role of the designer fundamentally: No longer will we design an experience, rather we will design for experiences—less director, more producer, to borrow a theatrical distinction.

2. Achieving continual service change
Traditionally services have been designed to operate in perfect isolation, as if the outside world had no impact on the customer’s experience of them.

To achieve truly effective Living Services, the outside world will in many cases directly influence and shape the service experience. Services must be designed both to listen and collect data beyond the scope of the core service proposition that can enhance the response to customer usage and the relevancy of what they are offering.

Listening implies tagging and integrating information and service options that are relevant to a consumer at that point in time, at the location or in the context in which they are accessing the service, or the way in which they are doing so.

So for example, a service could listen for external data that can inform the narrative, such as geographic location, proximity to travel, retail, utility providers, time of day, weather and travel updates, local and national events.

Services will also seek out, recommend and connect the consumer with third-party services that augment the core service or start-point of the conversation. As we have already pointed out, in effect this means the atomization of branded services so that they become delivery neutral.

In this respect the service should be geared to search for relevant, open, third-party APIs into which it can either plug or integrate into itself. As the ecosystem of open-service APIs grows, a searchable approach to third-party service integration will be preferable, but in the interim service providers may seek to create affiliated service clusters with whom they can co-operate.

Rather than a tunnel-vision approach to designing a service with a fixed range of options and functionality, Living Services require an evolutionary capability to be designed in from the beginning.

An early example is Pantene’s ‘Beautiful Hair Whatever the Weather’ campaign, which helped customers who checked the Weather Channel to avoid weather-related bad hair days by offering them a geotargeted ‘haircast,’ with the right Pantene product to match the weather on the day in question.

An indicator of how automated Living Services will continually adapt to our personal preferences and the context we find ourselves in can be seen in the programmatic marketing industry.

Companies such as Chango, which was first to launch a Programmatic Marketing Platform (PMP) in the U.S., tailor marketing campaigns according to realtime analysis of audience behavior broken down to anonymous individual profiles. Although
behavioral targeting across social media, retail and digital display is at a relatively early stage in its evolution, it points to how brands might optimize Living Services.

No longer will we design an experience, rather we will design for experiences—less director, more producer, to borrow a theatrical distinction.

Programmatic technology is able to analyze in real time which consumers are most likely to act in a certain way or be interested in a brand message. A customer journey is plotted for each anonymous individual, recording the messages or the information that individuals see and ultimately what level of interaction a person had with a brand campaign.

Other advertising technology companies, such as Conversant Inc., are already blending online behavioral data with offline Customer Relationship Management (CRM) data to create a more holistic picture of people’s preferences and behavior.

DESIGNING FOR HUMAN BANDWIDTH

In parallel to this radical shift from static to continual design informed by individualized data analytics, we will also see a profound change in the way we physically access and interact with digital services.

This change will result in digital interactions becoming more organic and less clinical and mechanical. They will be lifestyle-centric and fit more naturally into our everyday behavior.

We have already seen a move away from point-and-click devices toward touch screens, and while screens will remain and indeed become a bigger part of our lives, we will also increasingly see our bodies being used as both a controller and an interface.

Children who are growing up with multiple interactive touch screens as a normal part of their everyday experience will almost certainly feel at home with fast, responsive and dynamic interfaces.

They will expect rooms and environments to be interactive and to be able to connect with content or interfaces fluidly as they move from one context to another. They will expect dynamic interfaces to revolve around them.

Some mechanical interfaces as we know them will disappear and be replaced by Natural User Interfaces (NUI), as we use parts of our bodies or unique genetic makeup to get things done more efficiently and intuitively. As this scenario unfolds, human bandwidth will become a vital component of design thinking.

Consider the human body a bit like we do computers—as a device. When we think about bandwidth in terms of devices, we think about upload and download times of data. We need to think about ourselves in the same way. What is the quickest, most reliable way to get information into and out of the human body?

Reliability is one key. Just as a dropped call on a mobile phone is irritating to both parties, so missed data from the body could be a hindrance to a clear analysis of what is going on.

Another factor to consider is what the most suitable interaction for the information is in context. There are a number of ways of getting information into the body: It could be sound, through the ears; visual, through
The MC10s BioStamp is a flexible microprocessor that can verify a person's identity.

In a collaboration between Philips, Emotiv, Accenture and Fjord developed a proof of concept to show how people suffering from amyotrophic lateral sclerosis (ALS) and other neurodegenerative conditions could potentially control their environment and smart products around the home using brain commands and wearable technology. The proof of concept was based around Emotiv Insight, a wireless EEG headset that detects brain commands, microfacial expressions...
and emotional states and could enable users to issue brain commands to control Phillips products including Philips Lifeline medical alert service, Philips Smart TV and Philips hue personal wireless lighting.

What’s more, we are reaching a point at which human data is being measured in unexpected ways: Dermatologists can use smartphone photos to make a diagnosis.

When it comes to designing interfaces that use human bandwidth, instead of thinking about devices like wearables, wristbands or amulets, it’s probably more appropriate to think about the service flowing through that wearable than the design of the hardware. The key question is: what is the information that I want to get out of the body to make that service viable?

**While screens will remain and indeed become a bigger part of our lives, we will also increasingly see our bodies being used as both a controller and an interface.**

For example, a mirror with a smart camera behind it is a rapid and appropriate way to extract a lot of health data from the face and the way in which it changes from day to day. There’s a formula to be applied here that involves measuring bandwidth against usability in order to come up with an appropriately designed service interface.

With Google Glass, for example, Google decided the quickest way of getting information into the body is through the eyes and the quickest way of getting it out is voice. In contrast, the adidas miCoach Smart Run watch for athletes, incorporating haptic technology, uses different alert methods depending on what’s most appropriate for different training information.

It uses vibration to tell you you’ve gone past a kilometer and if you glance at your watch you can see your split times for that kilometer. The visual function is best manifested when it measures your heart

The adidas miCoach Smart Run watch for athletes, incorporates haptic technology.
rate, with the color coding showing if you’re running at the desired pace. It also uses the voice of well-known athletes, such as Olympic heptathlon champion Jessica Ennis-Hill, to give you coaching as you’re doing more complicated training routines.

Our skin, eyes and brain will gain prominence as NUIs. Body language will become an increasingly important element of service design, especially as we move into a mixed environment of screens and objects that don’t have screens.

**HUMAN-TO-MACHINE BODY LANGUAGE**

The rise of PCs, laptops and mobile phones has created a revolution in remote communications—a world where body language seams less important.

While human speech and text can seem more sophisticated in a face-to-face context, body language remains a vital way in which we transmit meaning and emphasis. Although there are cultural variations, all over the world we ‘read’ other people through their body language, be it consciously or subconsciously. In parallel to the use of NUIs, body language will become a significant component in design.

This will manifest itself in a number of ways:

**Gestures**

We are becoming familiar and comfortable with gesture technology whether we realize it or not; think of taps that feature a sensor to turn on the water. Gesture technology has the potential to be huge because when it is implemented in a way that is useful to people, it becomes something we barely think about, thereby reducing little friction points from life.

There will be more use of gestures, especially in a controlled domestic environment, where we’ll use them to turn music up and down or adjust lighting. Ericsson is experimenting with Connected Paper that allows you to cheaply print a circuit and tiny battery on packaging or a parcel. When you touch that parcel, it transmits information through your body to a phone or tablet you’re holding in another hand. Provided you have the right application open, it then gives you information about what you’re looking at, such as what’s inside the parcel, the product’s sell-by date and usage instructions—basically, any form of added-value communication.

Gesture-based technology is already being incorporated into product design by companies such as Reemo, which is effectively a wrist-worn mouse that enables users to gesture-control connected objects ranging from lights, kitchen appliances and blinds to computer hardware.

Others include PrimeSense, which developed the Microsoft Kinect sensor. The sensor has powered more than 20 million devices. PrimeSense was acquired by Apple in 2013 and is speculated to be developing a gesture-operable Apple TV.

But as gestures become a more regular feature, so too does the issue of ‘gesture conflict.’ As the technology proliferates, we will have an increasing number of gestural interfaces, creating the possibility of chaotic experiences where movements trigger unplanned actions.

There is currently no standard format for body-to-machine gestures covering different interactions and devices. Standards have evolved for a lot of other interactions; think how left, right and pause buttons first emerged on cassette tape.
players and are now a deeply familiar and standardized interaction.

There are three particular areas where gesture conflict could emerge. One is between the major technology platform owners. As they begin to embed gestures in their platforms as a standard means of user control, who will be the first to integrate and therefore ‘own’ the hand gesture for a command as simple as “stop”?

If this fundamental issue is not resolved it will cause deep inconvenience for users: For example, as I sit in my car, am I going to be using Spotify gestures or the car manufacturer gestures, which may mean different things?

Gesture technology has the potential to be huge because when it is implemented in a way that is useful to people, it becomes something we barely think about.

Similarly, gestures that are effective in one culture may not work in another. An icon of an open palm can be used to indicate a payment is happening but an open palm in Arabic countries can symbolize begging. Gesture technology raises the same cross-cultural issues that companies have already encountered when developing brand names.

Designing for Intent
We use a wide array of subtle gestures and signals in our daily interactions with each other to signify intent. The User Interface (UI) of intent is very important when navigating around the physical world.

As objects like robots and cars become smarter, we will need to begin to know what objects are intending to do, and likewise they will need to understand our intentions. This issue will grow as devices become more autonomous. When cars are self-driven, how do pedestrians waiting to cross the road

The Withings Wi-Fi Body Scale is an example of an open system.
know whether the car can see them as they are about to step out into the road? Without good design, they don’t know what the car intends to do and don’t know if it can read their intentions.

**Gestures that are effective in one culture may not work in another.**

Machine-to-person signalling is going to be a key issue going forward and one which Rodney Brooks of Rethink Robotics is already addressing. Brooks places graphical eyes on his robots, not to humanize them, but to signal their intent to humans, i.e. a look to the left means ‘I am about to move there.’ The robots automate simple functionality like shelf-packing and the eyes signal the intention of the robot because it has big heavy arms and when it’s about to move into a place and swing its arms it could hurt someone in its way.

**Face Speed**

Humans expect facial reactions when they speak to each other, and we read them at the same speed as we read each other’s faces.

As we begin to interact with objects embedded in the environment around, and as that process becomes more human, we’re going to become less tolerant of delays. We may put up with delays when we press a button on a computer because it is a machine and not human. Apple puts an icon up to show the computer is ‘thinking’ to help minimize frustration at the delay. But the more we talk to the fridge and make gestures at it, the more we will expect it to respond at human ‘face speed.’

This is as much a technology challenge as a design challenge, but the more designers humanize objects, the more we will expect them to respond at the same speed as humans.

If the new interaction paradigms fit with users’ need to interact with things in the most simple and natural way possible, they will flourish. But organizations need to be cautious and choose systems that can evolve and which are capable of coordinating and collaborating with systems developed by other companies. Smarter, faster service design solutions will not take off if users have to learn multiple new sets of gestures devised by different service suppliers.

In addition, many of the technologies and products currently available in this space are closed ecosystems, such as NikeFuel, a proprietary points system for tracking a user’s fitness activity—providing they are using Nike devices. Open systems and the ability for people to build around emerging standards will be critical for the sustainable growth of these technologies. The Withings Wi-Fi Body Scale is an example of an open system: The device, which measures consumers’ weight and body fat, syncs with third-party fitness app MyFitnessPal in order to automatically update the user’s weight in the app.

**The era of continual design, human-to-machine physical interaction and Living Services is gaining pace.**

Consumers will not tolerate a future world segmented by operating system silos that stop them from accessing Living Services fluidly. In fact, the battle between closed and open philosophies will be a major determinant of the speed of uptake of Living Services.
Businesses need to leverage big data, from multiple sources, to better understand their users and their behavior to create a service capable of augmenting their lives. The age of static services and static service design is drawing to a close.

The era of continual design, human-to-machine physical interaction and Living Services is gaining pace.
The design of Living Services will not just be about the elegant use of data and technology to solve a problem or save time. Designers and developers will also be informed by the way humans react to particular scenarios. In other words, Living Services will need to be tuned to consider how our brains work.

In his book, “Thinking Fast and Slow,” first published in 2011, economist Daniel Kahneman explored decision-making and behavioral economics. Kahneman’s research not only helps us to understand how the brain works, it also provides us with some critical learnings that will influence the design of Living Services.

His key insight is that the mind operates in two basic ways, which he calls System One and System Two. These are ‘fictitious systems’ that help us understand the way our minds work. An alternative way of describing them might be the ‘automatic’ and the ‘effortful’ system.

These descriptors hint at how they function: faced with a simple problem like ‘what is 2 x 2?’ or ‘what is the capital of France?’ our brains respond extremely quickly; it takes no apparent effort to call the solutions to mind. This is System One or the ‘automatic’ response system.

But if we are asked ‘what is 24 x 17?’, we shift into a different mental gear altogether. This is System Two or the ‘effort’ system.

System One is the low-maintenance random-access memory, which operates continuously with little or no effort. System One therefore learns association between ideas (for example, bat and ball) and calls these readily to mind. System Two swings into action when a question arises for which its automatic sibling does not have an answer.

There are several problems associated with this. One is that when operating under System Two you must pay attention, but the brain has a limited budget of attention. Effortful activities also interfere with each other; multitasking when in System Two is very hard indeed.

Another issue is that we try to use System One as much as possible to avoid going into System Two; our brains are wired to be lazy. Faced with a pattern we think we understand, System One grabs at answers, but our intuition often turns out to be faulty.

Kahneman’s insights have profound implications for designers seeking to create effective Living Services. A key question is which mental mode will people use to access or interact with the service? For example, a speedometer in a car is System One, a passport application form System Two.

System One design is likely to be ‘glanceable’, like a watch. Information graphics, or data visualisation, can convey ideas of relative measurements easily: for example, how much data is left on your monthly mobile plan and how many days to go until the end of the month? System Two design needs to bear in mind that the user has shifted to a mode so different that it is physically measurable.

Designers must also understand where consumers might encounter a choice that shifts them up a mental gear and how best to resolve that challenge.

Our brains will try to avoid System Two, the system requiring effort, so where possible Living Services will seek to work with our automatic responses in System One. Obviously, that is not always possible; so if it is System Two design, the Living Service must prepare the user for cognitive effort and reward users for that effort.
07 PRIVACY AND ETHICS: NAVIGATING OUR CHANGING VALUES
Data privacy: a shift in the balance of power

Awareness and concern about data privacy and specifically the use of personal information by digital service providers and communications channels is becoming one of the most significant issues of our time.

Living Services that draw on multiple, real-time, personal data feeds—blended with third-party information—inevitably raise questions around privacy and ethics. Who will own and have access to all this highly sensitive data? And what are the ethical implications for individuals and brands of our increasingly connected, trackable digital lifestyles?

A recent survey on data privacy by Accenture found that 80% of 20- to 40-year-old consumers believe complete data privacy no longer exists. What’s more, nearly half (49%) said they would not object to having their buying behavior tracked if it resulted in relevant offers from brands and suppliers.

However, the survey leaves no room for complacency for brands around privacy, showing that while consumers continue to embrace digital technology in order to secure a good deal, 70% believe that businesses aren’t transparent enough about how their information is being used, and 87% believe that not enough safeguards are in place to protect personal information.

Looking ahead, Fjord believes that the arrival of Living Services will disrupt the way in which consumers interact with brands, including how much and when consumers are prepared to share information or receive services based on personal data.

Currently the information exchange between brand and consumer is controlled by brands. As consumers, we have to go to them, either by ‘liking’ them on Facebook, following them on Twitter or ordering from them online. We can opt in or out of their policy on privacy and data. Usually we are in too much of a rush to care. Privacy is traded for convenience.

The emergence of Living Services heralds a new era, however, where services grow and evolve around consumers, placing us firmly in the spotlight and giving us greater focus over our lives and our data and privacy.
The recent decision by the European Union Court of Justice upholding an individual’s ‘right to be forgotten’ by search engines is an example of how power over data is shifting.

A recent survey on data privacy by Accenture found that 80% of 20- to 40-year-old consumers believe complete data privacy no longer exists.

The emphasis will start to move away from consumers learning about brands to one where brands have to make an effort to get to know consumers as individuals.

Imagine a scenario where brands follow their customers on Facebook and Twitter rather than the other way around. In fact, this is happening already, as social media analytics identify key influencers for either market-listening purposes or to attempt to directly influence. While this may present privacy issues, as social beings we already curate our actual and online public profiles in order to present those aspects of ourselves we want people to see and to hide those we don’t.

It is not such a big step, therefore, to control our profile as consumers and decide how well we want brands to know us and what information we are prepared to share with them. Like friends, those brands that make the effort to get to know us, behave appropriately and respect the boundaries of what we are and aren’t prepared to share, are likely to be invited into our lives. Those that do not will be isolated by personal online choices or automated systems that will protect us from abuse.

Brands that successfully build one-to-one relationships with their customers may well be trusted, for example, to take charge of their home security or travel arrangements. Those that don’t do this effectively or impose too heavy a price in terms of information exchange will not be granted this privilege and will lose our custom.

The shift in power will gain momentum as the commercial opportunity to empower people to control their personal information is increasingly recognized.

In fact, startups are playing a leading role in challenging the traditional data exchange between brands and consumers. Ghostery, for example, is a service that allows its customers to monitor and block the brands that are tracking them online, giving them greater control over their own data. And a similar service is offered by Safeplug, a device that plugs into Web routers in the home, channelling all internet traffic through an anonymous network so Web browsing can be private.

Major brands are starting to pick up on this demand for increased consumer control over personal data too. Telecommunications company Verizon recently launched its Smart Rewards program where its customers consent to share location, Web browsing and mobile application usage data, which Verizon’s partners use to send more targeted ads. In return, subscribers get access to savings and discounts on hundreds of brand-name products and discounts at 26,000 hotels. Meanwhile, retail tech startup Swarm, uses in-store Wi-Fi to track consumers’ Internet activity in a bid to deter them from comparing prices and showrooming. In return it offers consumers free Wi-Fi and uses their Web browser to deliver realtime coupons, promotions and discounts.
PRACTICAL AND PERCEIVED PRIVACY
For brands wrestling with how to handle privacy in relation to digital services, it’s important to be clear about the fact that while digital solutions offer obvious benefits to consumers, they do so at a cost. For example, the benefit of GPS tracking facility on smartphones has revolutionized how we get from A to B, making it virtually impossible to get lost.

If smartphones start to log user locations without their knowledge or permission, however, this represents a cost to consumers, which could be practical (what does this mean for my safety and security?) or perceived (this is an unacceptable breach of my privacy). The formula for a successful context-aware service is to always remember that the benefit - in terms of utility, automation, pleasure, beauty and new perspective—must always outweigh the cost, which could be loss of control, lack of privacy, distraction or anxiety.

Given the attitude of millennials to privacy, we think the question, ‘how will brands respect my data and personal privacy?’ Instead becomes, ‘how do I want to be known?’

Consumers are extremely wary of the costs of innovative digital services, and this wariness is arguably one of the biggest obstacles to the success of Living Services. A recent study by Acquity Group into consumer adoption of connected devices and smart technology revealed that concerns over privacy are a significant barrier to take-up when it comes to adoption of connected devices that could make their lives easier. The survey, of more than 2,000 U.S. consumers, revealed that 23% hadn’t purchased smart technology for the home due to concerns over privacy. Similarly, 19% were deterred from purchasing wearable technology due to privacy concerns.

Early indications suggest that consumers are right to be concerned about privacy in relation to connected devices and smart technology.

A recent review by HP’s Fortify security division of 10 popular app-controlled devices for the home, including a smart TV, smart thermostat and home alarm, found that all 10 had security flaws that made them vulnerable to hackers. In a separate experiment, the BBC put smart gadgets to the test by filling a house with connected devices ranging from baby monitors, smart TVs and plugs to Wi-Fi cameras, and then asking computer security experts to crack the security on them. All of the items featured were successfully hacked by the experts.

So how can brands ensure that the benefits of new digital services always outweigh the actual or perceived costs? Fjord believes they need to take two steps: First, brands need to reduce the implicit cost to consumers of Living Services by increasing:

- **Transparency**: Let me see what is happening to my data.
- **User autonomy**: Let me control my data.
- **Security**: Don’t leave holes in my personal network.
Second, brands need to boost the explicit benefit of Living Services by increasing, as appropriate:

- **Personalization**: Shape services around me.
- **Adaptation**: Understand changing external context.
- **Automation**: Remove unnecessary cognitive load from me.

**AVOIDING UNCANNY VALLEY**

Another challenge for digital service designers is the ‘uncanny valley.’ Coined by Japanese robotics expert Masahiro Mori, this hypothesis focuses on the interaction between humans and robots but is equally applicable to the area of Living Services.

Mori’s theory is that as a robot is made to look more human, the emotional response to it from us becomes increasingly positive and empathic until a point where the robot crosses a line and becomes too, but not quite, human. At this point our response to the robot is one of revulsion.

Masahiro observed that if the robot subsequently became less human in appearance again, those who interacted with it became more positive towards it.

For designers developing Living Services, the critical insight is to recognize the limitations of what is acceptable, namely not to assume that just because a service can do something, it should. Citizens may simply not appreciate being overly understood (especially if they do not grasp how it has happened): Spooky is bad. Designing purely on the basis of actionable data analysis is to ignore human traits including culture, mood, etiquette and sheer human unpredictability. These traits make the task of designing Living Services harder, but they are impossible to ignore without creating experiences that jar with people in the real world.

Simple mistakes that can blight digital service experiences that are already prevalent include:

- Misunderstanding consumers’ needs based on simplistic analysis of past behavior. For example, assuming that just because an individual went for a run this time a week ago, it’s time to prompt that person to go for another one even though they had a late night and had back-to-back meetings that morning.

- Removing options based on first decisions made when setting up a service or repeatedly defaulting to the first option or location chosen, regardless of the pattern of subsequent choices. Acting on consumers’ behalf without their approval by, for example sharing information with brands and social connections, or using statements and opinions out of context. Even if permission boxes have been checked, the assumption should not always be that consumers will approve.

- Failing to understand consumers’ cultural or social relationships or recommending inappropriate products or recommendations without considering the context of consumers’ everyday lives or established attitudes.

- Offering unsolicited advice.

These pitfalls are bad enough when the data and preferences used to deliver them are at a simple level. If the service is designed to be delivered by processing many different
The increase in services that can track, monitor and learn about intimate aspects of our lives raises important ethical issues that will need to be addressed by brands and service designers.

variables to the extent that the delivery feels too personal or even invasive, the negative impact could be far greater.

**For designers developing Living Services, the critical insight is to recognize the limitations of what is acceptable, namely not to assume that just because a service can do something, it should.**

Simply put, the problem for designers is that humans are counter-intuitive, emotional and often irrational beings. However, as the balance of data power shifts from brands or organizations to the individual, end users may recognize that with control comes responsibility, meaning that they will pay more attention to the kind of interaction that they value over time.

As Living Services become more commonplace, consumer protection and government bodies will have to take a keen interest in the issues around privacy. Regardless of consumers' growing confidence about managing their privacy and data, brands are going to need to be scrupulously transparent and ethical about how they use data in order to prevent a regulatory backlash that could stifle Living Services from the outset. That said, here, as in other areas of Living Services, a gap will open up for commercial services that tap into consumers' increasing knowledge and savviness about their data, helping them to understand its commercial value and how to negotiate with brands and other organizations to trade data in exchange for the best possible return.
**ETHICS: MOTIVATION VS. FREEDOM**

Consumer privacy is just one example of the wider social and moral issues raised by the emergence of smart, contextually aware digital services. The increase in services that can track, monitor and learn about intimate aspects of our lives raises important ethical issues that will need to be addressed by brands and service designers.

These issues will vary from sector to sector and will be informed by the potential uses of data. Let’s look at three areas where Living Services are already beginning to emerge:

1. **Health and wellness**
   Apple’s two-pronged entrance into the wearables, health and wellness sector, with the launch of both its Watch and its health platform Healthbook, underlines the growing importance of this sector.

   ABI research estimates the global market for health and fitness wearables could reach 170 million devices by 2017. If consumers increasingly opt to use wearable devices to track their health and well-being, it’s only a matter of time (setting aside current regulatory issues in individual markets) before insurance companies seek to price their services around that flow of data. In other words, if a consumer’s health looks good and they are constantly active, factoring in genetic variables, they are probably a better bet for longevity than someone who is a couch potato. A key ethical question for this sector is: Will society countenance the calculation of premiums based on how well an individual is taking care of themselves? Also, to what extent is it OK for the private or public sector to proactively motivate individuals to look after their bodies by behaving in certain ways through financial incentives?

2. **The connected car**
   From the unveiling of Google’s new self-driving car prototype together with the Dutch government’s plans to roll out public road tests of self-driving cars, the connected car is one of the areas where Living Services-type technology is likely to cause the most seismic long-term social and economic change. Of course, in the automotive sector, behavior incentives are well-established. However, insurance premiums only increase if poor behavior results in an incident where a cost is incurred and fault is proven. What if premiums increased because poor behavior made an incident more likely?

A key ethical question for this sector is: Will society countenance the calculation of premiums based on how well an individual is taking care of themselves?

It is not impossible to imagine a scenario in five to 10 years’ time, where someone is speeding and we no longer rely solely on speed cameras to catch the culprit. Instead, telematics in that driver’s car connect with nearby cars, gather information about the driver’s speed and proximity to other vehicles and relay this to the driver’s insurance company. The insurers then send a message to the driver’s dashboard warning that he or she is driving dangerously and that unless this changes immediately, their insurance premiums will go up. It’s even possible to imagine they will not be given the choice, and penalties could be applied automatically in real time.

LIVING SERVICES
The ethical issue here is that some people will see this development as a huge infringement of individual liberties, while others will view this scenario as an example where the greater good outweighs individual freedom.

3. The connected home and family
We are fast approaching a point where parents can monitor their children remotely while they’re at school or participating in other activities away from the home.

As noted in Chapter 4, in the U.S. an app called ClassDojo is already capturing realtime data about child behavior in the classroom that is being used to create stronger, tighter links between parents and teachers, specifically to improve classroom behavior. Once again, this kind of service raises the question of whether this infringes children’s right to privacy and whether it discourages independence.

All three scenarios raise key questions about the level of freedom we would like and the balance between cost and control in society. We should expect intense and growing debate about these issues in the media and among politicians globally.

WILL LIVING SERVICES CHANGE OUR BEHAVIOR?
A final ethical concern prompted by the future growth of Living Services is their potential impact on human behavior and how we interact with those around us.

Our ability to be connected to the rest of the world—via the Internet and mobile phones—is already proving to be a huge distraction from reality and one that Fjord’s Mark Curtis discusses in his book, “Distraction: Being Human in the Digital Age.”

One perspective is that Living Services will serve as an antidote to the distraction engine phenomenon caused by the earlier waves of the Internet and mobile.

Samantha’s technology is so sophisticated it’s able to respond to Theodore’s emotions in real-time. As the film progresses, he becomes increasingly emotionally dependent on ‘her,’ to the point where ‘she’s’ dominating his life.

While the premise in “Her” may seem far-fetched, it could be closer to reality than we think. Voice recognition features within mobile handsets such as Apple’s Siri and Samsung’s S Voice, which are able to respond to users and carry out personalized tasks, are now standard features. Meanwhile, the latest Xbox console, Xbox One comes with Kinect voice commands that allow users to interact with the console. Small wonder that Ray Kurzweil, director of engineering at Google, recently forecast that in 15 years’ time it will be possible to have an emotional relationship with computers.

So will Living Services offer new levels of disruption to the way in which we connect
and interact with each other, leaving us feeling increasingly alienated from each other and real life?

The honest answer is that it is probably too early to tell. One perspective is that Living Services will serve as an antidote to the distraction engine phenomenon caused by the earlier waves of the Internet and mobile. By offering services that are individually tailored to our needs and filtering out non-relevant data, they may help us to become less distracted by digital services, as we become more confident that they can deliver what we want, when we want it.

In addition, as the physical interfaces we’ve become used to, such as screens and keyboards, increasingly make way for natural user interfaces (NUIs)—our voice, skin, eyes, and brain—there will be fewer physical barriers between us and the outside world, allowing us to feel more involved and connected to the real world, rather being barred from it by a virtual device-centered barrier.

As digital services evolve, addressing these important issues about how they will impact privacy, ethics and humans will become vital, in order to ensure Living Services really add and improve the quality of our lives rather than the reverse.
CHAPTER 1


Venmo https://venmo.com/


Yelp http://www.yelp.co.uk/

AroundMe http://www.aroundmeapp.com/


Gartner says Personal Worlds and the Internet of Everything Are Colliding to Create New Markets, Gartner (Nov 11, 2013) http://www.gartner.com/newsroom/id/2621015


Pebble https://getpebble.com/

Jawbone https://jawbone.com/

Fitbug Orb https://www.fitbug.com/uk/orb?lng=en_UK

Nicola Davis, Smart Umbrellas keep you dry and check the air you breathe, The Guardian (June 19, 2014) http://www.theguardian.com/environment/2014/jun/19/smart-umbrellas-check-air-quality


Sifteo Cubes https://www.sifteo.com/cubes

Srciftables http://alumni.media.mit.edu/~dmerrill/siftables.html

InfrActables https://www.youtube.com/watch?v=2l59zCQ3JbE

Beats Music http://www.beatsmusic.com/

Trunk Club https://www.trunkclub.com/

Birchbox http://www.birchbox.co.uk/

CHAPTER 2


Zappos http://www.zappos.com/


If This Then That https://ifttt.com/

Evernote https://evernote.com/
BillGuard https://www.billguard.com/?ref=access
Mint https://www.mint.com/how-mint-bills-works/pay
Tink https://www.tinkapp.com/en/
Pocketsmith https://www.pocketsmith.com/
24me http://www.twentfour.me/?ref=access
Liam Don, Tackle behaviour so teachers can do their jobs, The Independent (Jan 17, 2012) http://blogs.independent.co.uk/2012/01/17/tackle-behaviour-so-teachers-can-do-their-jobs/
ClassDojo https://www.classdojo.com/en-GB/
BeHere http://www.beelieve.com.br/behere/
Arizona State University https://net.educause.edu/ir/library/pdf/ESPRNT123ASU.pdf
Duolingo https://www.duolingo.com/info
Chai Energy http://www.chaienergy.com/
Novi Security http://www.novisecurity.com/
Wallflower http://www.wallflower.com/
Ecobee https://www.ecobee.com/
August Smart Lock http://www.august.com/
Philips hue http://www2.meethue.com/en-gb/
Quirky.com, Egg Minder: https://www.quirky.com/shop/619#
Zac Hall, GE-backed Quirky Aros is a window air conditioner with Nest smarts, controlled by iPhone, 9to5mac.com (March 19, 2014) http://9to5mac.com/2014/03/19/ge-backed-quirky-aros-is-a-window-air-conditioner-with-nest-smarts-controlled-by-iphone/
Neura http://www.theneura.com/
SmartThings http://www.smartthings.com/
Apple http://www.apple.com/
AT&T http://www.att.com/#fbid=dkf8qIN0nw
AT&T Digital Life https://my-digitallife.att.com/learn/
Nextdoor https://nextdoor.com/
Neighborland https://neighborland.com/
Citymapper https://citymapper.com/london
Streetline http://www.streetline.com/
Enevo http://www.enevo.com/
Tvilight http://www.tvilight.com/about-us/introduction/
Burberry Regent Street, Retail-Innovation http://retail-innovation.com/burberry-regent-street/
Amazon Dash https://www.amazon.com/dash/
Hiku http://hiku.us
The Outside View http://theoutsideview.co.uk/
Siraj Datoo, These companies are tracking the fitness of their employees, The Guardian (March 17, 2014) http://www.theguardian.com/technology/2014/mar/17/why-companies-are-tracking-the-fitness-of-their-employees
Sleep Cycle http://www.sleepcycle.com/
Moves https://www.moves-app.com/
PocketScan https://www.kickstarter.com/projects/177622658/pocketscan
Ca7ch Lightbox https://www.kickstarter.com/projects/ca7ch/ca7ch-lightbox?ref=discovery
Amazon Kinesis http://aws.amazon.com/kinesis/
James Wilson, Minors Tap Into Rich Seam Of Internet Of Things Financial Times (July 16, 2014) http://www.ft.com/cms/s/0/854fb212-084b-1le4-9380-00144feab7de/authorised=false.html?_i_location=http%253A%252F%252Fwww.ft.com%252Fcms%252Fs%252F854fb212-084b-1le4-9380-00144feab7de.html%253Fsiteedition%253Duk&siteedition=uk&_i_referer=%23axzz3Vx5WO7tn%20please%20hyperlink%20to%20BHP%20Billiton%20at%20start%20of%20paragraph

CHAPTER 5
Deezer http://www.deezer.com/
SoundCloud https://soundcloud.com/
iGaranti https://www.fjordnet.com/workdetail/igaranti/
Philip Ryan, Half of All Mobile Banking Customers Are Now Part of ClearXchange (February 19, 2014) http://bankinnovation.net/2014/02/half-of-all-mobile-banking-customers-are-now-part-of-clearxchange/

CHAPTER 6
http://www.oi.ox.ac.uk/news/?id=1162
Chango https://www.chango.com/
Programmatic media http://en.wikipedia.org/wiki/Programmatic_media
Conversant LLC. http://www.conversantmedia.com/
MC10 http://www.mc10inc.com/
Emotiv http://emotiv.com/
Philips Proof of Concept https://www.fjordnet.com/workdetail/philips/
Philips AutoAlerts http://www.lifelinesys.com/content/
Philips Smart TV http://www.philips.com/content/global/country-selectors/www/en/smarttv.html
Google Glass http://www.google.co.uk/glass/start/what-it-does/
adidas miCoach smart run https://www.fjordnet.com/workdetail/adidas/
Reemo http://www.getreemo.com/reemo-developers-program/
PrimeSense http://en.wikipedia.org/wiki/PrimeSense
Apple TV http://www.apple.com/uk/appletv/
Rethink Robotics http://www.rethinkrobotics.com/
Withings Wi-Fi Body Scale https://www.myfitnesspal.com/apps/show/7
MyFitnessPal https://www.myfitnesspal.com/
Daniel Kahneman, Thinking Fast and Slow (2012) http://www.amazon.co.uk/Thinking-Fast-Slow-Daniel-Kahneman/dp/0141033576

CHAPTER 7
Rory Cellan-Jones, EU court backs ‘right to be forgotten’ in Google case, BBC News (May 13, 2014) http://www.bbc.co.uk/news/world-europe-27388289
Ghostery http://www.ghostery.com
Safeplug http://pogoplug.com/safeactivate/
Smart home kit proves easy to hack, says HP study, BBC News (July 30, 2014) http://www.bbc.co.uk/news/technology-28569342
Mark Sullivan, Apple’s ‘Healthbook’ will finally debut as part of iOS 8 this Monday, VentureBeat (May 31, 2014) http://venturebeat.com/2014/05/31/apples-healthbook-will-finally-debut-as-part-of-ios-8-this-monday/
Her (film) http://en.wikipedia.org/wiki/Her_(film)
Apple’s Siri https://www.apple.com/uk/ios/siri/
Xbox One http://support.xbox.com/en-GB/browse/xbox-one/kinect/Voice
Hannah Devlin, Search engines will be able to flirt with users by 2029, The Times (June 14, 2014) http://www.thetimes.co.uk/tto/technology/article4118943.ece
ABOUT FJORD

Fjord is a design and innovation consultancy, acquired by Accenture Interactive in 2013. We create useful, effective, and desirable digital services that people love. We help the world’s leading businesses make complex systems simple and elegant with the power of design. Founded in 2001, Fjord employs a diverse group of over 400 design experts in fifteen global creative hubs including Atlanta, Berlin, Chicago, Helsinki, Istanbul, London, Los Angeles, Madrid, Milan, New York, Paris, San Francisco, São Paulo, Stockholm, and Sydney. For more information visit www.fjordnet.com.

ABOUT ACCENTURE

Accenture is a global management consulting, technology services and outsourcing company, with more than 323,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world’s most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US$30.0 billion for the fiscal year ended Aug. 31, 2014. Its home page is www.accenture.com.

ABOUT ACCENTURE DIGITAL

Accenture Digital, comprised of Accenture Analytics, Accenture Interactive and Accenture Mobility, offers a comprehensive portfolio of business and technology services across digital marketing, mobility and analytics. From developing digital strategies to implementing digital technologies and running digital processes on their behalf, Accenture Digital helps clients leverage connected and mobile devices; extract insights from data using analytics; and enrich end-customer experiences and interactions, delivering tangible results from the virtual world and driving growth. Learn more about Accenture Digital at www.accenture.com/digital.

Copyright © 2015 Accenture

All rights reserved. Accenture, its logo, and High Performance Delivered are trademarks of Accenture. This document is produced by consultants at Accenture as general guidance. It is not intended to provide specific advice on your circumstances. If you require advice or further details on any matters referred to, please contact your Accenture representative.

This document makes descriptive reference to trademarks that may be owned by others. The use of such trademarks herein is not an assertion of ownership of such trademarks by Accenture and is not intended to represent or imply the existence of an association between Accenture and the lawful owners of such trademarks.